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News Update

Judge Denies Motion To Reverse Catamore

By Molly Upton
Of the CW Staff

PROVIDENCE, R.I. — The next round in the IBM vs. Catamore Enterprises, Inc. case will take place in Boston before the First Circuit Court of Appeals, following Judge Raymond J. Pettine's denial of an IBM motion which asked the judge to overturn the jury verdict awarding Catamore \$11.4 million or order a new trial [CW, Nov. 12].

Pettine postponed a decision on Catamore's request for interest and costs and denied Catamore's motion for sanction against IBM counsel.

"We are disappointed our motion for a judgment notwithstanding the verdict or for a new trial has been denied," an IBM spokesman said.

"We feel the jury verdict was contrary to the evidence and the law and will appeal to the U.S. Court of Appeals for the First Circuit," the spokesman said.

In his 13-page ruling, Pettine indicated counsel for IBM had requested him to "look beyond the record and overturn the jury verdict based upon the court's

(Continued on Page 2)

Airtrans to Run Again At Dallas/Fort Worth

By Patrick Ward
Of the CW Staff

FORT WORTH, Texas — The Dallas/Fort Worth Airport Board and LTV Aerospace Corp. have settled their differences, and the airport's automated passenger trains should be back in service in mid-January, according to an airport spokesman.

The Airtrans system, which depends on a minicomputer for supervisory control, has been idle since March [CW, Nov. 26].

LTV had stopped work to protest the Airport Board's decision not to accept the system. The Airport Board and eight airlines said Airtrans failed to live up to contract specifications.

The airport and airlines and LTV launched suit and countersuit against each other amounting to almost \$1 billion in total.

The settlement calls for the airport to accept the current Airtrans system and to pay LTV \$7 million in damages.

LTV, in turn, will deliver a Modular Computer Systems (Modcomp) II to back up the Airtrans' Modcomp III central control computer. LTV also agreed to provide additional technical services and training.

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For Violating Civil Rights

Police Sued; Outdated NCIC File Cited

By Nancy French
Of the CW Staff

CONCORD, N.H. — Failure to update a record in the National Crime Information Center's (NCIC) wanted persons file has resulted in a lawsuit against seven policemen.

William A. Smith, a 25-year-old Dover man, claimed he was "rousted" from bed, taken to the local police station and questioned for four hours by police who said his name matched an alias in the NCIC file.

Smith filed suit in U.S. District Court here seeking \$75,000 in compensatory damages and \$25,000 in punitive damages against three police officers from Durham, three from Dover and one from the University of New Hampshire on grounds his civil rights were violated.

The incident occurred June 1, about six hours after Smith's car was stopped by Dover police and he was issued a defective equipment tag because a tail light on his vehicle was not working.

Apparently his name and date of birth were later teletypewritten to the NCIC in Washington, D.C., and a "hit" was registered.

Police arrived at Smith's residence at about 4:00 a.m., handcuffed him and took him to the Dover Police station

where he was photographed, fingerprinted and interrogated for almost four hours, his complaint said.

According to New Hampshire law, police may hold a suspect for four hours without charging him.

Smith said police tried to get him to admit being named "Barnes", the surname of a man who was going by the alias "Bill Smith" and was wanted by the New York police.

Smith, who attended high school in Northwood, N.H., with Sgt. Kenneth

Laderbush of the Durham Police Department four miles away, claimed Laderbush could have identified him. The police officers involved, however, refused to telephone Laderbush or permit Smith to telephone anyone, Smith said.

No apparent effort was made to verify whether the "Bill Smith" sought by New York police was still at large, Smith also claimed.

It was later learned police had picked up the New York man before June 1, the

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McGill Indicates AT&T Gearing For Industry-Oriented Products

By Ronald A. Frank
Of the CW Staff

NEW YORK — AT&T's Transaction Telephone is probably the first of many terminal devices tailored to solve the problems of a specific industry.

But even this terminal device can be classified as a technology-driven development rather than a customer problem-solving type of device, according to Archie McGill, director of market man-

agement at AT&T.

If the Bell System is to be effective in solving users' needs, it will have to understand what the users' problems are and, in order to find out, McGill has set up an industry marketing organization patterned very much after IBM's.

The goal of this group is to first define user needs and then develop those needs into a product that will allow the user to optimize his solution as well as derive maximum use out of the telephone network, McGill said in an interview.

McGill feels the Transaction Telephone is only "a piece of the solution" because it also needs a network, a data base and the switch to solve the customer's problem. The device is based on capabilities developed outside the Bell System rather than being part of an overall phone company solution, he said.

"We don't have to provide the data processing machine, but we have to understand how the data processing machine relates to the total problem," he said.

While IBM puts its DP boxes at customer sites, the phone company has the ability to put its boxes at Bell installations in order to provide needed capa-

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Navy Team Defines Hypo-Cobol, Ansi Variant for Small Systems

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. — A working definition of Hypo-Cobol, a variant of the 1974 American National Standards Institute (Ansi) Cobol specifications intended for small systems, has been completed by a U.S. Navy team and will be available soon from the National Technical Information Service for review and comment.

Though "reasonably happy" with the definition as it stands, developer George Baird of the Navy's Automatic DP Equipment Selection Office (Adpeso) said recently he and his coworkers "very definitely" want feedback so problems can be recognized — and, hopefully, cured — to prevent their inclusion in the language.

Organizations are free to reproduce the Hypo-Cobol definition and to build compilers from its specifications, according to Baird. The Federal Cobol Compiler Testing Service has already developed audit routines with which to validate Hypo-Cobol implementations.

Once the definition is finalized, it will apparently become part of the Federal

Information Processing Standards (Fips), which sets rules under which data processing is done by government agencies.

Because of the size of the government's DP operations, these standards are likely to have a "ripple effect" on nongovernment users as well, observers have noted.

Hypo-Cobol is a proper subset of the full 1974 Ansi specifications, Baird emphasized. Most of the elements selected for inclusion are required in any imple-

(Continued on Page 4)

FAA Has Gift for Travelers—DP-Based Collision Alert System

By John Hebert
Of the CW Staff

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) is giving a belated Christmas present this year — in the form of a computerized aircraft collision warning system — to all people who travel by air.

The FAA is installing a Conflict Alert System (CAS) into all 20 Air Route Traffic Control Centers (ARTCC) in the continental U.S.; all of the centers should have the system by Jan. 1, according to an FAA spokesman.

The CAS should serve to reduce the number of near collisions in midair, such as the recent incidents involving passenger and general aviation aircraft flying too close to one another in the Chicago and Cleveland airspaces, the spokesman in-

dicated.

The alert system was developed by the Mitre Corp. of McLean, Va. and was coded by IBM Corp. for integration into the IBM 9020 CPU-based systems in ARTCCs [CW, Oct. 29], the spokesman said.

The CAS is capable of recognizing what the flight path of an aircraft will be in two minutes, if the plane is equipped with an altitude-reporting transponder, he said.

This allows enough time for a controller to instruct the aircraft in conflict to assume another flight path, he indicated.

When even a remote possibility of conflict in flight paths is calculated by the alert system, the alphanumeric displays representing each aircraft on the traffic

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Notice to Subscribers

The next issue of *Computerworld* will be a combined issue and will be dated December 31-January 5.

With that issue, CW will be making the transition from Wednesday dating to Monday dating in order to better reflect the timeliness of the publication.



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Discrimination Suit Focuses on DP Tapes

By Catherine Arnst
Of the CW Staff

MINNEAPOLIS — Computer tapes containing personnel data have become a controversial issue in a race- and sex-discrimination suit brought by Marceline Donaldson against Pillsbury Co.

Pillsbury has refused to provide the tapes to the plaintiff because "the computer tapes per se are not relevant to the case," according to a lawyer involved in the company's defense.

However, "our feeling is that they have something to hide," Percy Julian, attorney for Donaldson, said.

Donaldson filed suit in May 1974 claiming she was fired from Pillsbury on the basis of racial and sexual discrimination.

She believes that her allegations of bias can be substantiated by information on the tapes and that patterns of hiring and promotion would be revealed by an analysis of the data.

Under the procedures for discovery, Julian requested information concerning computer tapes for a two-month period so he would know which specific tapes to

request. The company refused to provide this information and asked the court that it be allowed to destroy the tapes.

Pillsbury said that the facts on the tapes had already been made available to the plaintiff in hard-copy form and that the material on the semimonthly tapes are redundant since the information is back-up to that on year-end tapes.

The company sought to modify an injunction handed down in May 1974 prohibiting it from destroying any tapes and documents pertinent to the case. Pillsbury said the tapes are expensive to store and could be reused, "sparing ourselves some modest expense," a defense attorney said.

"It's not valid that the tapes are hard to store," Julian said. "We offered to store the tapes for them under lock and key."

The preservation of the semimonthly tapes is important, he added, because the records of some employees who work for only a short time might not be included in the year-end tapes.

"Our contention is that we don't know what's on the tapes," Julian said. "We at

least want to look at them and see if we agree."

"Pillsbury said we already had the information which we would ultimately seek, which simply isn't true," he said.

Protracted Long Enough

The company said the trial had been protracted long enough and should go to trial as soon as possible. "We are anxious to have it decided," a defense attorney said.

"Hundreds of pages of documents have already been provided," he continued. "The company has incurred a lot of expense already on the case. It would cost the company literally tens of thousands of dollars to copy the tapes and to educate on how to use them properly," he said.

A 1970 amendment to Rule 34 of the Federal Rules of Civil Procedure concerning the procedures of discovery stated: "The inclusive description of documents (which can be requested) is revised to accord with changing technology. It makes clear that Rule 34 applies to electronic data compilations from which information can be obtained only with the use of detection devices... In many cases this means the respondent will have to supply a printout of computer data... (or) the electronic source itself."

However, the amendment also stated that "the courts have ample power... to protect the respondent against undue burden or expense either by restricting discovery or requiring that the discovering party pay costs."

"It is so crystal clear that the tapes should be handed over," Julian said.

"We could not prepare the case properly without the tapes," he concluded.

Young, Affluent Consumers Most Likely EFTS Customers

WEST LAFAYETTE, Ind. — Young, affluent, sophisticated consumers will be the most likely customers of cashless, checkless, electronic funds transfer systems (EFTS), a report by Purdue University's Credit Research Center said.

This relatively small segment of the U.S. population accounts for a significant portion of the nation's money transactions, according to the survey.

Principle concerns raised by survey respondents include what EFTS will cost the consumer in convenience, accuracy and expense. Further: Can EFTS be trusted to protect personal information, stay accurate and assure the consumer control over his transactions?

ACM Nominators Fail to Name Vice-President to Presidency

NEW YORK — Nominations for officers of the Association for Computing Machinery (ACM) for 1976-78 broke with

Judge Denies Motion

(Continued from Page 1)

understanding as to what meets the minimally acceptable standards of the general business community's profit projections.

"Such standards are not subject to judicial notice," Pettine remarked.

"Furthermore, I note IBM had ample opportunity and resources to present these same arguments with supporting testimony to the court and subsequently to the jury. I find nothing now properly before me for my consideration which would cause me to alter my earlier ruling on the admissibility of these projections and I reaffirm them," he said.

Catamore clearly acknowledged duplication of damages throughout the course of the trial, he added.

Thomas K. Christo, lead attorney for Catamore, said "we are pleased the trial judge in his reasoned opinion agrees with us that the jury verdict was supported by the evidence and look forward to similar result should IBM decide to prosecute an appeal."

tradition when, for the first time in a decade, the group's vice-president was not nominated to succeed to the presidency.

Nominees for the presidency include Peter Denning, professor at Purdue University, and Carl Hammer, director of computer sciences at Univac.

Vice-presidential nominations went to Stuart Lynn, professor at Rice University, and Eric Weiss of Sun Oil Co.

George Dodd of General Motors Research Laboratory and Bruce Van Atta, professor at the University of Rochester, were nominated for secretary.

The nominating committee, chaired by Anthony Ralston, did not nominate Dr. Herbert R.J. Grosch, the incumbent vice-president, for the presidency, marking the first time this had happened since 1966.

Selections were chosen by looking "at the spectrum available and choosing the best qualified," Ralston said.

Petitions are currently being circulated to place Grosch in the running for the 1976-78 presidency, according to Grosch.

The candidates will be voted on by all members of ACM except student and associate members and all ballots must be in by April 25. Those elected will take office at the end of June for a period of two years.

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Law Amends 1903 Expediting Act

Tunney Bill Could Prolong U.S. vs. IBM by Two Years

By Edith Holmes
Of the CW Staff

NEW YORK — U.S. vs. IBM could remain in the courts up to two years longer than expected because of a law passed last year.

Most will remember that law as the Tunney bill which, when it became the Antitrust Procedures and Penalties Act, made the public review of proposed consent decrees law.

But most people don't realize that embedded in that law is a section which could keep antitrust cases brought by the U.S. government in the courts for a longer period of time.

In addition to requiring the government to draw up and file with the district court hearing an antitrust case a statement explaining the competitive impact of a proposed consent decree and allowing a 60-day period for the public to comment on that statement, the law approved by Congress last Dec. 21 also amends the Expediting Act of 1903.

Passed when the appellate courts were both unfamiliar and untried, the Expediting Act allowed any antitrust case brought by the government to be appealed directly from a federal district court to the Supreme Court. The act was passed to speed up the settlement and relief of cases generally believed to have considerable impact on the public good by eliminating the necessity of an appeals court

hearing.

Last year's amendment to the Expediting Act made appellate review between the district court and Supreme Court levels a normal course of procedure. Antitrust cases brought by the government can still go directly to the Supreme Court, but only if the U.S. Attorney General certifies that the case is crucial to the public's welfare. The Supreme Court must then decide to hear the case on that basis as well.

If the Supreme Court does not accept the Attorney General's certification of the case, the case is returned to the appeals court serving the district in which the case was originally tried. The appellate court hears the suit, which may later be appealed to the Supreme Court.

The amendment to the Expediting Act contained in the Antitrust Procedures and Penalties Act is intended primarily to relieve the Supreme Court of the case load it faces these days and to allow the appellate courts to refine what the high court must hear of the original, often voluminous trial record.

Interestingly enough, the Computer Industry Association (CIA), which attended the hearings on the Tunney bill and approved of its measures regarding public scrutiny of consent decrees, did not comment on this portion of the act.

The CIA did indicate its concern "that

Edelstein Puts His Foot Down

NEW YORK — In an unprecedented evening session of U.S. vs. IBM here recently, the judge hearing the antitrust case told counsel for the government and the corporation he would keep them all night if that was necessary to complete the testimony of the witness then on the stand.

"I intend to finish with Mr. Ingersoll tonight," Judge David N. Edelstein said, gesturing toward John Ingersoll, a vice-president with General Electric Corp. (GE) and at one time associated with GE's computer business.

"You indicated we would finish with this witness by 4:00 this afternoon," he said, adding that the case is progressing far too slowly and that it is time both parties started living up to the schedules they set.

Accordingly, the court recessed for dinner, resumed at 5:30 and suspended for the day at 9:30 when Ingersoll's testimony was completed and he was excused from the stand.

Of the principal participants in the

case, only Thomas D. Barr, lead IBM attorney from the firm of Cravath, Swaine and Moore, was absent from the courtroom during the evening session.

Edelstein Comments

Edelstein made more comments during those few hours than he has for the past month concerning the appropriateness of objections to evidence and testimony presented by both sides.

At one point he told attorneys for the government and IBM, "I don't want to run out of patience in this case," suggesting that they sharpen every aspect of their presentations to the court.

"I still have some discretionary power, and I intend to use it," Edelstein continued. "I'm not going to allow the process of attrition to reach excessive heights. . . I'm not going to allow this to become a game for suppressing the truth."

the consent settlement process not be made so litigious that advantages of flexibility, expedition and efficient use of manpower are lost."

Had CIA officials read further into the proposed law, one wonders what comment they would have made regarding the amendment to the Expediting Act.

Study Exonerates DP in Near Collision of Aircraft

By John Hebert
Of the CW Staff

WASHINGTON, D.C. — Results of a preliminary investigation into the causes of a near collision involving two scheduled passenger aircraft about 30 miles northwest of Carleton, Mich., recently indicated there is little, if any, reason to believe the computerized air traffic control system tracking the planes was at fault.

The initial investigation and subsequent public deposition of five air traffic controllers from the Cleveland Air Route Traffic Control Center (ARTCC) and crews of both the Trans-World Airlines (TWA) Lockheed 1011 and the American Airlines (AA) McDonnell Douglas Corp. DC-10 revealed human error rather than computer system error as the direct cause of the near hit, according to a spokesman for the National Transportation Safety Board (NTSB) here.

The occurrence resulted in damage only to the DC-10 (a nonstop flight from Chicago to Newark, N.J.), 10 flight attendants and 14 passengers, with three of

the passengers seriously injured, the NTSB report said.

The AA flight was gaining altitude out of O'Hare Airport until it reached 34,953 feet (pressure altitude), at which time an air traffic controller at the Cleveland ARTCC realized its flight path would directly infringe on the airspace the TWA flight from Philadelphia was coursing on an opposite heading.

Urgent Order

The DC-10's pilot was given an urgent order from Cleveland ARTCC to "descend immediately to 330 [33,000 feet], according to the NTSB preliminary report. "According to [the DC-10's] Digital Flight Data Recorder (DFDR) information, the highest altitude reached by AA 182 was 34,953 feet (pressure altitude) followed by a descent to 33,000 feet in about 32 seconds. The TWA 37 DFDR showed that the aircraft was cruising at a pressure altitude of 35,000 feet," the NTSB preliminary report said.

Upon further investigation, in the form of the public deposition, an NTSB spokesman has said that deposition testimony taken indicated evidence only of human error.

Controller 'Preoccupied'

Apparently, when the two scheduled jets were heading into their collision course, a Cleveland air traffic controller "became preoccupied" with attempting to enter flight plan information of a third aircraft, a Lear Jet, into the computerized system, the NTSB spokesman said.

The controller was said to have taken about two minutes to enter the flight plan into the terminal, when he should have given the information to a manual operator.

After the information was entered, the controller was relieved by another controller, who was not briefed on the progress of the DC-10, the spokesman added.

Approximately 6-1/2 minutes later, the relief controller realized the danger of imminent collision and reported his command to descend to 33,000 feet to the pilot of the DC-10, who immediately responded by plunging the aircraft into a

35-degree dive.

Full results of the NTSB investigation may take several weeks to complete, the NTSB spokesman said.

Testimony on Statistics

In response to the recent rash of close calls, the Congress called an open session last week to hear testimony on Federal Aviation Administration (FAA) statistics related to this problem by Dr. John L. McLucas, administrator of the FAA, a spokesman said.

During the question-and-answer period following the testimony, it was discovered there were 207 incidents of near

collisions reported to the FAA from the beginning of this year through October, he said.

Human Error Cited

Of these, 32 involved aircraft operating under air traffic control — under the control of automated radar systems — and all 21 incidents occurred because of human, rather than computer system error, the spokesman explained.

In addition to the Congressional inquiry, the NTSB is considering whether it should conduct a full investigation of the causes of so many close calls, an NTSB source said.

FAA Readies Present For Air Travelers

(Continued from Page 1)

controller's Raytheon radar scope flash until evasive action is taken by pilots of the collision-course aircraft, the spokesman said.

The system has a capability of covering aircraft above an altitude of 18,000 feet only, he added.

Test programs are being conducted at four ARTCCs to add greater capabilities to the CAS, allowing it to respond to craft above an altitude of 12,500 feet under radar conditions, the spokesman added.

This program should be operational in about 2-1/2 months, the spokesman said.

A CAS would have avoided the near collision between a DC-10 and a Lockheed 1011 carrying a total of 308 passengers that occurred late last month near Carleton, Mich., he indicated.

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U.S. Puts Teeth Into Cobol Validation Requirements

By Don Leavitt
Of the CW Staff

WASHINGTON, D.C. — The biggest DP user of all — the U.S. government — has now told suppliers what Cobol compilers it will accept, what they have to do to prove proposed compilers are acceptable and what will happen if their compilers are defective.

The message: shape up or get lost.

That message was contained in an amended Federal Property Management Requirement (FPMR) published in November by the General Services Administration.

Cobol was defined as the language for business-oriented government DP work while the 1968 American National Standard (ANS) specifications were still in force. Later "Federal Information Processing Standard Publication 21" (Fips Pub 21) was revised to name the 1974 ANS specifications as the proper base.

Now the FPMR has specified the Federal Cobol Compiler Testing Service (FCCTS) and its audit routines as the means of validating compilers coming into the federal inventory.

In addition, the Cobol Interpretation Committee set up by the National Bureau of Standards has been named arbiter of any "unresolved questions and/or ambiguities" remaining after FCCTS has run its test.

12-Month Response Time

Defects spotted by FCCTS in a proposed compiler must be corrected by the vendor within 12 months — or any shorter period the request for proposal (RFP) may specify — or any subsequent attempts to propose the defective compiler in any government bid "shall be considered nonresponsive."

Responses to unfavorable decisions from the Cobol Interpretation Committee must also be met within those time limits or later bids including the compiler will — again — be considered "non-responsive."

According to the FPMR, every RFP with a Cobol requirement must state the implementation level required, according to the four-level definition contained in "Fips Pub 21-1." Vendors must specify in their responses what level their compilers meet.

Bids can be considered on that basis, but "all Cobol compilers coming into the federal inventory shall be validated," the

new regulation said. And FCCTS must be used as the validating agency.

When a vendor asks FCCTS to validate a compiler, the requester is responsible for providing the necessary test facilities. The validation is performed on a cost-reimbursable basis, but the requester is provided an estimate of costs before any FCCTS work is done.

At the end of its testing cycle, FCCTS

will provide a Validation Summary Report (VSR), the amended FPMR noted. These summaries may be used by the vendor in conjunction with subsequent proposals offering the same compiler, an FCCTS spokesman noted later.

VSRs are available from the National Technical Information Service in Springfield, Va., for most of the compilers that have been through the validation process.

This means users anywhere can find out how well various compilers measure up to objective standards, if they have been measured at all, he noted.

By the same token, ready availability of VSRs might encourage vendors to have their compilers checked out and the capabilities summarized or face the prospects of users wondering why the compilers haven't been tested.

Navy Team Defines Hypo-Cobol Subset

(Continued from Page 1)

mentation of a low-level Cobol compiler as defined in Fips publication 21-1, he acknowledged, but Hypo-Cobol does not contain all the low-level elements and does contain selected elements from higher level implementations.

The effort to define Hypo-Cobol was prompted by a perceived need for a small-scale package that could exist in mini-computer and time-sharing environments which impose resource limitations too severe for "normal" Cobol compilers, he explained.

A version of Cobol was needed which could provide basic capabilities without making extreme demands on system resources at compile time. Hypo-Cobol was designed to reduce the size of the compiler and its related work areas and to eliminate redundancies in the conventional language statements, he added.

By eliminating optional words, the reserved word list is decreased and other grammatical structures are substantially reduced in size, resulting in commensurate reductions in storage requirements and in compile time needed for parser actions, Baird continued.

Cutting out functionally redundant statement formats or options provides the same benefits as reducing the reserved word list, he noted. Beyond that, Hypo-Cobol places limits on all statements where ellipses exist, so the maximum size of a statement is fixed.

Limits User-Defined Names

In another move to reduce time and storage but with a potential impact on the readability of the user's source code, Hypo-Cobol also limits the size of user-defined names to no more than 12 characters. Full Cobol normally allows 30-character names.

Working with Adpeso on the definition

of Hypo-Cobol were personnel from the Navy's Programming Standards Section, Capt. Grace Hopper's organization. It took the team just under 200 hours to extract those portions of the 1974 Ansi specifications it felt useful for Hypo-Cobol.

For various reasons, no elements were included from the Indexed I/O, Sort/Merge, Report Writer, Segmentation, Li-

brary or Communications modules, Baird noted.

The current definition can be ordered from the National Technical Information Service, 5285 Port Royal Road, Springfield, Va. 22161.

Comments about Hypo-Cobol should be sent to Baird at the Software Development Section, Adpeso, Department of the Navy, here in Washington, D.C. 20376.

Deputy Showing Off Terminal Learns He Shouldn't Tempt Fate

GARLAND, Texas — Never act as the guinea pig when you're demonstrating a new computer system because you never know what that system will turn up, lawmen often warn.

Dallas County Sheriff's Deputy Larry Guinn learned that lesson the hard way recently when a new computer terminal he was showing off revealed he has been carrying a stolen gun for three years.

The gun has since been returned to its rightful owner.

Guinn, who retrieves and enters information on suspects and stolen property in the National Crime Information Center's (NCIC) computerized file, was showing how the system works on a terminal in the Garland Police Department recently and decided to use the serial number of his own Smith and Wesson .38-caliber revolver in the demonstration.

He keyed the number into the terminal as observers looked on.

Much to everyone's amazement, the terminal reported the gun was stolen on July 3, 1972 from a Dallas man.

"All I could say was 'uh well, now you know what a real hit looks like,'" Guinn said.

A "hit" is an indication that a person being checked on is wanted by authorities or that property being checked is stolen.

The Dallas police traced the weapon's original owner to his new home in Houston and the gun was returned.

The dealer from whom Guinn bought the weapon for \$92.50 claimed he didn't know the gun was stolen. He said he sold it in good faith and refused to replace it.

Guinn vowed that, in the future, he'll check the serial number of any weapon he's interested in against the NCIC file before he buys it.

Outdated NCIC File Results in Lawsuit

(Continued from Page 1)

date of the New Hampshire incident, but failed to update the NCIC wanted persons file.

After being held nearly four hours, Smith said he was only too happy to sign a waiver exonerating the police from any guilt in the case in exchange for his freedom.

Smith also charged the police with acting "willfully, knowingly and with specific intent to deprive him of his rights of freedom from illegal searches and seizures of his person and effects and of his rights of freedom from unlawful arrest, detention or imprisonment."

Further, Smith charged the police with entering his house "without any warrant or probable cause."

Police refused to comment on the case. The defendants in the case have 20 days to answer the complaint. A pretrial hearing will be set 30 to 60 days later.

Airtrans to Run Again At Dallas/Fort Worth

(Continued from Page 1)

The main function of the Modcomp III is to "cut down on the number of people required to keep eyes" on the trains, according to Don J. Ochsner, Airtrans manager for the airport.

When the computer went down, extra people had to be called into the control room to fill the gap. The backup Modcomp II should improve this situation, Ochsner said.

Despite its past troubles, Airtrans can handle the job for which it was intended, he added. "We wouldn't be taking it over unless we had confidence in it," he said.

McGill Indicates

AT&T Gearing Toward Industry-Oriented Products

(Continued from Page 1)

bility to users, he added.

Asked whether Bell is planning any type of packet-switched services for data users, McGill said this is certainly one of the possibilities but would not be more specific.

He did say, however, that the communications world is going digital and in this context data, voice and other communications modes can be substituted for one another with ease in a digital transmission system.

Interface May Change

One area that may change as Bell introduces new equipment is the man-machine interface. Up to now AT&T has looked at its network from "phone-to-phone or modem-to-modem," but easier ways will have to be found for the user to communicate and move his information, McGill said.

In this regard, if a non-Bell supplier has developed a capability that would lend itself to a telephone company device or service, he would encourage that the outside capability be incorporated into the Bell offering, McGill said.

One industry being studied intensively by his organization is banking and the entire electronic funds transfer area, McGill said. He indicated any equipment designed to handle such transactions might also be able to record Stock Keeping Unit information as part of a point-of-sale capture capability.

"Our orientation is more to the network than to the terminal and, while we will have terminals, our motivation will be to make our system acceptable by many people's terminals," he said.

A "Nothing" Solution

Until now Bell has looked at data communications problems as being solved on a modem-to-modem basis, but this is "a nothing" solution, McGill said. AT&T will have to look at solutions "from a data processor-to-data processor, computer-to-computer, or computer-to-person" basis.

"Then we would have come up with a solution that is transparent to the user," he said.

The Bell system can continue to provide data processing as part of its capability without violating regulatory constraints,



CW Photo by R. Frank

Archie McGill

he said. The Federal Communications Commission's (FCC) Computer Inquiry guidelines allow AT&T to provide hybrid services that are primarily communications-oriented with incidental data processing.

"If the FCC meant putting information over telephone lines and optimizing the cost of that communication," then Bell will have problems providing hybrid services, "but I don't believe that is what the FCC meant," McGill said.

Davis Cites Software Requirements

Federal Agencies Need Procedures for Privacy Act

By Nancy French
Of the CW Staff

WASHINGTON, D.C. — To comply with the Privacy Act of 1974, federal agencies will have to develop procedures and software that allow them to record and control disclosure, assure records are complete and maintain an individual's dispute claims within easy access of the file itself, according to Dr. Ruth Davis, director of the National Bureau of Standards' (NBS) Institute for Computer Sciences and Technology.

The agencies will also need software and procedures to maintain a usage log and verify data periodically to assure it is both accurate and necessary to keep.

In addition, they will also have to assure records are uniquely identified to prevent ambiguity and ensure accuracy.

Finally, techniques will be needed to allow selective access to such files as medical records which, under the act, the government may withhold from data subjects.

Davis presented these views in a paper prepared recently for the Privacy Protection Study Commission, established by the Privacy Act to study the state of privacy in both the public and private sector and recommend future legislation to Congress and the President.

Written Consent Required

Under the law, "agencies must obtain written consent from each data subject for the disclosure of personal data," Davis pointed out.

If permission was obtained at the time the data was collected from the subject for specific purposes, additional permissions must be obtained if the data is to be disclosed for other purposes, she said.

To comply with the law, soft-

ware and procedures will be needed to generate requests for consent of the data subjects, she said. Software and procedures will also be needed to record and update a data subject's access control information, indicating those uses for which the data subject has given permission.

But even before disclosing personal data, the agency must be able to validate the requestor's authorization to access the requisitioned data.

Disputed Data

In cases where an individual has filed a dissenting claim concerning data presently held on him, that claim must be forwarded to the person or agency requesting his records.

To assure this is done, agencies will need software and procedures to alert them such a claim exists and to retrieve the claim and transmit it to the requesting agency, Davis said.

"The may involve the development of an automated file or the annexation of claims to an existing file," she explained.

Davis suggested that, under guidelines issued by the Office of Management and Budget, an agency could adequately store a subject's claims by flagging the disputed fields in the individual's record and storing the actual statement offline in hard-copy form.

Such data must be stored so it can be retrieved readily whenever the disputed portion of the record is to be disclosed, she noted. In the case of personal data systems supporting on-line disclosure through terminals, this almost requires on-line storage of claims, she said.

Technical Requirements

Davis identified technical requirements for recording an individual's access to records.

One important consideration in

drives, a tape unit and associated peripherals.

Each member university has its own local computer installation, ranging from a Xerox 530 to an IBM 370/145, which handles administrative data processing, Jack Thompson, Micc executive director, said.

The Micc facility is primarily used for instructional and research computing, he said, ranging from computer-aided instruction (CAI) and problem solving to interactive statistical services through the statistical programming for the social sciences (SPSS) package.

Using CDC Kronos operating system, Micc can offer several modes of job processing concurrently: time-sharing, remote batch, local batch and deferred batch.

Files created in the local and remote batch or time-sharing mode are fully accessible during other modes, assuming the proper user number and password are entered through the terminal, Thompson said.

Auditing Not Enough to Maintain Confidence

WASHINGTON, D.C. — If public confidence is to be maintained in public and private agencies that handle personal information, techniques are needed to examine and then attest to a system's privacy, security and information management standards.

However, current auditing methodology — the use of techniques of logic and mathematics — does not allow one to prove software actually performs its intended functions in all cases and over all conditions.

These views were expressed recently by Dr. Ruth Davis, director of the National Bureau of Standards' (NBS) Institute for Computer Sciences and Technology, in a report to the Privacy Protection Study Commission.

In auditing a computer system, "the auditor is not primarily looking for a good audit trail... he is looking for good internal controls," Davis said, quoting recent DP literature.

Those include about seven different types of controls including organizations control, which is essentially physical computer security and operations management.

Input control, or the assurance data is accurate and error-free, is another and poses a problem for any system "whether the data concerns dollars or criminal indictments," Davis said.

Hardware control, or the availability of memory protect, fail-soft power supplies, memory save procedures to assist in record recovery and restart and maintenance and spare parts to keep a system up, was also mentioned by Davis.

In addition, Davis cited software control, which concerns such items as "the availability of label checking on files, routines which enable records of access of files to be made and use of

console interrupt switched to be recorded on a logging printer or tape."

As for program controls, Davis described these as software controls written into application programs. Under this category one may put "reasonableness checks and limit checks that may help prevent errors in input data and detect errors in data manipulation," she said.

Output controls were described by Davis as reviews of reports obtained from the system to ensure all data that needs to be reported is being produced in the correct format and at the correct intervals.

"To the extent that an audit trail is to be demonstrated, the output controls must insure it is there," she said.

Finally, she cited system control, or documentation of the flow of the system from preparation of source documents to distribution of output reports. This is the overall review of whether the data system is carrying out its intended function," she explained.

However, Davis warned the commission, "current methods of auditing data systems cannot be said to be formalized even though they may represent the best practice available."

As an aid in correcting this situation, the NBS is studying program design concepts which reduce the number of total combinations of conditions needed to be examined, as well as file organization and manipulations. It is also examining program testing concepts, among them trace routines that examine the paths taken in program execution.

In addition, the bureau is studying ideas that involve testing programs against a variety of input and parameter conditions and zero defect data entry methods.

storing records about an individual is the "technical linking" of an individual's records in such a way that, if they are retrieved, all data about the individual will be obtained.

If an individual who requests his records finds later he had not received his entire file, he might interpret this as "a deliberate act to circumvent regulations on the part of the agency, whether intentional or not," she explained.

Davis also emphasized the need to identify subjects "uniquely" to prevent ambiguity and ensure accuracy, suggesting in very large files it might be necessary to include such characteristics as parentage, sex, color of eyes and previous places of residence and employment.

Similar considerations apply to assure a person accessing personal records is actually the person he claims to be. "For access to sensitive data, recognition may involve comparison of signatures, fingerprints, voice-prints or facial characteristics," she pointed out.

Davis noted the need to develop a means to selectively access certain records — such as medical records — which the government may withhold from the data subject.

"The impact" of this requirement on recordkeeping is that it may be useful to "encode each separable part of a record according to its legal category of retrievability." Computer programming logic could then be used to control the retrieval of records accordingly," she said.

Good information practices require retrievals, accesses and alternations be accompanied by specifics including time of access, Davis said. This audit trail

of activity in the system should be able to answer any questions on what records were accessed or changed.

"If a record is to be changed because the agency has determined it to be in error or because of a normal update, specifically defined technical procedures should be used. These should assure that the change is authorized, that the reason for the change is recorded and that the previous content of the record is retained in archival storage," she said.

These procedures should also assure changes are recorded, she added, noting one of the "most frustrating situations an in-

dividual faces in dealing with a recordkeeping system is forcing the system to correct errors in records even after changes have been agreed to."

Finally, to assure recordkeeping systems continue to be valuable, it is necessary to assure the accuracy of data.

One way to do this is to make certain data entered into the system is accurate in the first place. Entry methods employing visual review before entry, such as with a CRT, may reduce errors in this process. Alternately, source documents that are readable, for example by OCR machines, may also reduce errors, she explained.

Five Universities Form Cooperative To Provide Centralized DP Services

EDWARDSVILLE, Ill. — Cooperation is the key to providing computer services to support instructional and research programs at five universities in this state.

The five institutions, which include Eastern Illinois University, Illinois State University, Sangamon State University, Southern Illinois University at Edwardsville and Western Illinois University, have joined together to form the Mid-Illinois Computer Cooperative (Micc) under the sponsorship of the Illinois Educational Consortium for Computer Services.

Initial funding for Micc has been provided by direct state appropriations. The annual \$500,000 grant has allowed the placement of one remote job entry (RJE) terminal and six interactive terminals at each member institution.

The central computer facility located here consists of a Control Data Corp. Cyber 72/14, 12 peripheral processors, four disk

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Editorial

Dear Santa,

Once again, we in the DP department at Flako Air Lines and Storm Door Co. are sending you our Christmas requisition list. We still believe in you, even though several of our previous correspondences were either ignored or perhaps were just lost in the mail.

We know the list is long, but our needs are great and growing every year.

First, as always, we'd like realistic deadlines and better problem definition from our users as a stocking present. If they could ask for what they want the first time — and not after the system has been designed — it would be a great help.

Alternatively, you could fill their stockings with switches and ashes — coal's too valuable this year.

Also high on the list would be adequate budgets. You've helped us with presents of leased equipment, plug-compatible peripherals and software packages in the past, but a shrinking dollar can only go so far, particularly since our friendly computer manufacturers keep raising their rates.

You might consider them on the switches and ashes list too, but please don't tell them we suggested it.

And please help our staff attack real problems and not just dream of pie-in-the-sky elegant answers for which there never was a question. They're all good people — no switches and ashes here — but sometimes they get carried away with the individual trees and don't seem to see the forest.

Besides our everyday problems and requests, we also would like some presents dealing with issues of national importance. For example, we'd really like some answers — and promise to be good all year if we get them — about the U.S. vs. IBM antitrust case. Please attach answers to questions such as "Who's on first?" "Is there a first?" and "Will it ever be over?" to our tree if possible.

Don't tell our boss this, but we'd also like it if you could keep computers out of our private lives. Even on weekends, we can't go to the supermarket without having to figure out those funny coded labels on a can of peas.

Also, Santa, we keep getting computer-generated dunning letters, even after we've paid many a bill. If you would just straighten out that system, we'll always eat everything on our plates — including food from the company cafeteria.

A big package of standards might be nice, too. Last year you left a big box with a shiny ribbon and a tag that said standards, but it was empty. Maybe you could put something in there this year, and we'll promise to be good and recycle our printouts next year.

Well, the list could go on forever — but if you read *Computerworld* every week, you're familiar with most of the items.

But, most important, we would like you to use your influence in the right places so the computer can do some good for us all. We have many problems in this world that could be solved if people would apply the power of the computer more wisely.

Finally — since we're a little short of paper around here and microfilm doesn't work well as cards — would you carry our best wishes for a happy holiday time to all our friends in the computer community. And even to those who aren't very friendly.

Sincerely yours,

Flako DP



'... And for You, a Nice Bullet to Bite On'

Letters to the Editor

Reports of Honeywell's Death Greatly Exaggerated by Press

During the past few months there have been numerous articles written about Honeywell, its new policies and its future in the computer business. Only after close inspection, prompted by dramatic headlines, does one come to realize that the majority of the verbiage comes from neither Honeywell nor Honeywell users.

Certainly the opinion and interpretation of "outsiders" is newsworthy, but so are the feelings of those involved or affected; for this reason we felt compelled to air some comments made at a recent meeting of the Honeywell Wisconsin User Group.

If Honeywell is to be criticized concerning its policies, the criticism should be leveled at the method used to disseminate information to its employees and customers.

The confusion, misunderstandings and apprehension generated by the lack of communication showed the method of announcement to be inadequate, to say the least. However, the policies, once explained to each individual user, made sense, and as far as destroying the resale value of Honeywell computers, phrases such as "death rattle" did far more damage than did the policies.

We Honeywell users know that Honeywell will generate, again in 1975, a considerable portion of its income from its data processing operation. We understand that, unlike General Electric and RCA, this represents approximately one-half of Honeywell's total sales.

In addition, Honeywell announced the possibility of acquiring the Xerox Corp. computer base which increased the confidence we users have in Honeywell's intention and ability to stay in the data processing industry.

To paraphrase Mark Twain: "The reports of Honeywell's death are greatly exaggerated!"

John J. Gaffney
President

Honeywell Wisconsin Users Group
Madison, Wis.

Control Over Systems Needed

Frank D. Booth was shot and killed a few days ago by a Florida state trooper after a computer check of the license on Booth's car retrieved the record of a license issued three years previously [CW, Dec. 10].

One wonders what, if anything, will happen to the person or persons who designed the computer system which precipitated this event.

A physician or lawyer who, through a negligent act of omission, caused the death of an innocent person, however indirectly, would be subject to certain investigation and possible censure by his medical or bar association.

Until we in the data processing field have a similar method of policing ourselves, we certainly cannot consider ourselves professionals.

More important, we will have no control over the irresponsible use of systems which can cause irreparable harm to innocent people.

Bob Brown

Atlanta, Ga.

Avoid Source of Suffering

In the Dec. 3 issue, I found myself at considerable odds (again) with Herb Grosch's notions about minicomputers and microcomputers.

I found myself absolutely unable to equate Assembly language and a lack of peripherals with "simplicity" — or, for that matter, with low costs. The keys to efficiency are not "cheap" and "simple" but "useable" and "suitable."

Grosch has obviously not thought at all about the range of applications he wants performed if he can say that the only good computer is a piece of "pig iron" with a good assembler.

I will spare Grosch a lecture on the state of computing and on why fancier machines can be cheaper and simpler; after all, he is a founding-father type and should know all that.

Laurance Wygant

Chicago, Ill.

'Simple' Not Always 'Suitable'

It seems that hardly a week goes by without a letter from Laurance F. Wygant bemoaning the latest irritation visited upon him by *Computerworld*. Since Wygant prides himself on his logic, he should exercise some by avoiding the source of his suffering, unless...

Wygant appears to spend a great deal of time writing letters (no articles, mind you). Doesn't he work? Is he looking for work? Or is this his work?

Adrian Register

Philadelphia, Pa.

Grosch Names EFTS Candidate

Angelino Schuster showed how little he knows about Washington when he suggested I want a seat on the electronic funds transfer system (EFTS) commission [CW, Dec. 10].

I have no more chance of a Nixon/Ford appointment in Foggy Bottom country than Abby Hoffman. Besides, the appointee has to be diplomatic as well as knowledgeable.

The obvious candidate is Paul Armer, recently named head of the American Federation of Information Processing Societies committee in the electronic funds transfer area.

Dr. H.R.J. Grosch

Sunnyvale, Calif.

(Other letters on Page 8.)

Letters to the Editor

Application Requests

Total 20,000 at ICCP

The Institute for Certification of Computer Professionals (ICCP) is pleased with the increasing support and interest we are receiving from practitioners, which is recognized and reflected in the press, but must point out an error which appeared in Alan Taylor's Dec. 3 column in *Computerworld*.

Our announcement stated that "this year's requests for applications have reached 20,000." We did not state that "20,000 applications had already been received," as reported in Taylor's column.

The number of applications for next year's Certificate in Data Processing (CDP) examination is expected to exceed this year's application count of 2,363.

However, this year's favorable response and the postal strike in Canada dictated an extension in our registration deadline, so the final registration count is not yet available.

Paul M. Pair
Secretary

ICCP
Chicago, Ill.

Logic Prevails

I wish to take issue not so much with the substance of the report from Lisbon [CW, Nov. 26], but with the kicker over it which read: "Popular Power Reigns."

Now that the moderates (also "people") have somehow wrested control from the Communist military faction, we should be informed that logic and reason

have prevailed over emotion and might — the latter epitomized in the sobbing paratroopers laying down their arms and relinquishing the last airbase held by the ultraleft.

It is to the everlasting credit of the Portuguese that such a cataclysm has been resolved with the shedding of tears instead of an endless flow of blood and entrapments. Not every revolution leads to such a reasonable denouement.

H.K. Spriggle

Collingdale, Pa.

Look for Source

Some of the recent comments concerning NCR really astonished me.

Certainly some computer hardware has plenty of downtime while other equipment has practically none. But, doesn't that hold true for all computer manufacturers?

Maybe Ed Tunstall [CW, Oct. 15] should look for the source of his hardware problem rather than looking at the nameplate on the equipment's "skin."

Now, David McMonigle's letter [CW, Dec. 3] really got my goat! It sounds as if he is impressed with anyone who is unimpressed with NCR.

He should take a closer look at NCR's progress in the computer industry (under President William S. Anderson's leadership). He will probably find the "unpacked" user will have no more of a rough time than with other manufacturers and less than with some.

Don Peterson

Austin, Texas

Facility Management

Some weeks ago, before we ran the news story on the Seattle facility management bid fiasco [CW, Nov. 12], I got into trouble for the first time with our libel lawyers. How even the most venomous columnist could libel Computer Sciences, my least favorite software house, boggles the mind. But our lawyers said I probably had, so a golden opportunity to memorialize FACT, early Univac software, operations in Huntsville, New York offtrack betting, and other CSC high points melted away.

Today I'm going to be a good boy and take a positive view. After all, I told Wernher facility management was a great idea, when I was bidding for the ABMA/NASA contract back in the Fifties. And I still think it is, if very carefully considered.

First of all, there has to be a need. The usual one is current inept operation, but there are many others. The key to von Braun's shop in Alabama was that he had good operation, and lots of mazuma, but could not get enough civil service slots to spend his dough in-house; the solution obviously was to have Generous Electric hire most of the computer lab's people, freeing up fifty or sixty openings and costing only a little more. Hoard for horde, so to speak!

Another common problem is lack of a path for advancement in the parent organization. Especially when there is a small DP shop embedded in a major outfit, or when advancement depends on an M.D. or Ch.E. degree — Badische drove away the best computer operations pioneer in West Germany that way — it may be a fine idea to hire an outside outfit where good people can go up to top management, even though they leave your own facility in the process.

And of course there is always the overwhelmed case, where a vast or brand new computer operation has to be set up overnight.

Financial savings — tightwad mode, I call it — does not generally constitute a

sufficient excuse. Certainly, a facility management contract ought to save or, more realistically, promise to save money. But it's sort of a thermodynamic argument, like the one that says more layers of software *have* to slow down a system, that the central overhead and profits of the management firm are extras. Maybe they'll be so much better you'll save enough to cover those extras, but don't count on it.

Above all, the Seattle imbroglio teaches us that the candidates for a contract should be decent and honest. How to write such a requirement into a municipal — or for that matter, a Federal — contract is a very nice problem, to which lawyers notably have failed to contribute. But it sure is the key qualification. No matter how expert, no matter how experienced, no matter how frugal, a management company that you cannot trust is a perpetual disaster. In selling GE Phoenix to Huntsville, I stressed the reasonably upright corporate stance as a major attraction (after all, if the civil servants wouldn't switch over, the whole ploy failed). That was before all those vice presidents were sent to jail for Excessive Collusion!

Anyhow, I repeat: first, probity. Expertise, yes. Savings, maybe. Good people, very very high. But first, probity.



Herk Grouch

Multiple Mailings One of DP's Unsolved Problems

A letter about data processing came to me recently from John Trotter of Los Angeles with a cry for aid and a suggestion.

His cry was to stop him from being buried by multiple mailings from the same sources, and his example was a duplication of invitations for January and February seminars on data base management systems.

Now, multiple mailings may not be one of life's major problems, but they are a problem — and a data processing one, too. The problem is that we have only 24 hours in a day and taking some of this time up unnecessarily is almost a form of stealing it, from the recipient's point of view.

As with too-intrusive phone calls, many people object and will continue to object to duplicate mailings, even though mathematically it could perhaps be shown that their objections concern only a trivial amount of time.

Multiple mailings are a data processing problem for three reasons. Two of these fall under the Salton Rule, which says that errors occurring because of the existence of DP are DP errors, even though they are not committed by computers or computer people.

The DP characteristic of multiple-mailing problems are:

- Mass mailing is a computer phenomenon.

These errors, even though not directly computer-related, occur because computers exist and are used to make the mass-mailing systems much more efficient.

- Mass mailing errors are seen by the recipients as being DP-related.

The addresses, with their hieroglyphic numbers, all-capital printing and uneven lines just cannot be mistaken for anything except a computer product.

- Solving mass-mailing problems is "obviously" within the power of computers.

This is because anyone who is thought to be able to solve a problem is always blamed for not solving it — even though he can't actually solve it and didn't even cause it in the first place.

Address Comparisons

Trotter's letter showed how pervasive the "obvious-solution" factor is. He claimed that even a modest address comparison program would have eliminated the multiple addressing shown (See Figure 1).

The implication is that the people running the Data Base Management Systems Comparative Evaluation Seminars simply don't care about wasting his time — and so are ripe to be punished.

Factually, if unobviously, I don't think his claim is true, if the aim of the mailing system is to be achieved.

Certainly, an address comparison for the Drew Postgrad Medical School at "1647 E 120th St., Los Angeles, Ca. 90059"

would find two identically surnamed Trotters, but is J Trotter Prin EDP Analyst in Building D really "John Trotter"?

Should this modest address comparison program eliminate such ambiguities? That isn't a modest system change; it is a big one, as I think Trotter will appreciate.

But most people will not appreciate it. They will continue to blame computers.

It is against this background of an "obvious" but impractical solution that we should consider the techniques of solving DP problems such as that of multiple mailings.

It is also noticeable that Trotter does not make any reference to the direct mail industry's approach to the problem.

The direct mail people maintain a list of people who don't want to be on any mailing lists. You can write to them, and they will tell all their members to drop you from solicitations altogether.

But Trotter has no objection to being invited to the seminars — he objects only to multiple invitations. So the industry solution doesn't work for him.

Nor does his solution to the problem

appear to be appropriate. His idea is to raise postage rates to force address comparisons through economic pressures.

But, as noted above, address comparison itself is not the real solution he has assumed it is. So out goes that solution, at least for the moment.

But the problem doesn't go away, unfortunately. And it really is a DP problem which is no nearer being solved as 1976 breaks than it was when the year began. DP, so far as I can see, has made no progress toward an approach to these Salton-type problems.

My question is, therefore, how can we start handling this type of problem? Is there any way anyone knows about or thinks about that might realistically help DP attack the problem areas it has either caused or aggravated?

If you have any thoughts, please let me know. Thank you. And happy holidays to every one of you.

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The Taylor Report By Alan Taylor, CDP



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90059P0001 7509 H
JOHN TROTTER
DREW POSTGRAD MEDICAL SCHOOL
1647 E 120TH ST
LOS ANGELES CA 90059

Figure 1. The two addresses shown above were described by Trotter as being "typical multiple mailings which could be eliminated by even a modest address comparison program." Could you design such a program while keeping a mailing system efficient?

Won't Affect Russian Decisions

ACM Resolution on Soviet DPer an Exercise in Futility

The Council of the Association for Computing Machinery (ACM) recently passed a resolution expressing the hope that Dr. Valentin Turchin, a dissident computer scientist, be permitted to leave the Soviet Union to accept a post at Columbia University [CW, Dec. 10].

Gerald Salton, ACM northeast regional representative, does not agree. Part of his dissenting opinion, published in an ACM newsletter, is reprinted below.

By Gerald Salton

Special to Computerworld

Valentin Turchin is a Russian computer expert who for some years has had increasingly serious problems with the Soviet authorities because of political activities with which the government there disagrees. His activities include open support for Andrei Sakharov and other Soviet dissidents and the signing of petitions and appeals of which the Soviets do not approve.

Unhappily for Turchin, he is not as prominent as Sakharov or Solzhenitsyn and thus, instead of being booted out as Solzhenitsyn was, he is being denied the right to exercise his profession and otherwise subjected to

harassments of various kinds.

You may ask what all this has to do with the ACM. First, Turchin is apparently an active computer scientist; second, he is an ACM member because an American friend for reasons not entirely clear has recently paid Turchin's ACM dues; finally, Turchin has been offered a post as a visiting scholar at Columbia University, and the Soviet government has up to now refused to let him come.

I cannot go into all the details and ramifications — the backup material furnished to Council in this case covered over 150 pages. Suffice it to say the Council was faced with a resolution "expressing the hope that Dr. Turchin will be permitted to accept the invitation by Columbia University and voicing its concern that he may be prevented from doing so."

Unconvinced of Effect

The resolution itself I consider unexceptionable; scientists in many countries — not only in the Soviet Union — have been used as pawns by their respective governments for a long time, and the situation of dissident intel-

lectuals is generally intolerable.

On the other hand, one may ask what the ACM Council can or should do about such matters. I myself agreed with the ACM

devote our energies full time to ferreting them out and to drafting appropriate resolutions.

In the end, all these considerations were swept aside be-

other hand, the harassment continues, it will be said that our action was too late or not forceful enough.

Once it was agreed to put the matter to a vote, the resolution itself was adopted by a vote of 18 in favor, none opposed, with five abstentions.

I wish most sincerely that we will have done some good in this instance. But we represent neither the Executive Board of the National Academy of Sciences nor a collection of Nobel prize winners, and the government of the Soviet Union can hardly be expected to wait for the pronouncements of a few unknown American computer people before deciding on policies which they treat as entirely internal in any case.

Reader Commentary

Constitution and Bylaws Committee which suggested that no action be taken: I perceived a substantial political component in the manner in which Turchin recently became an ACM member and in the reasons for which he was offered a visiting appointment at Columbia University.

I am also unconvinced an official position makes any difference whatever in the Soviet Union or elsewhere; when Jean Sammet [ACM president] some months ago transmitted a Council resolution to the U.S. State Department, she received no response, not even an official acknowledgment.

Finally, as we venture forth into such areas, it will become increasingly difficult to draw the line anywhere. Injustices and untenable situations occur all over the world; we might as well

cause a substantial majority of Council convinced itself the ACM could save Turchin from disaster and the resolution was in fact compatible with the defined purposes of the association. In such circumstances any opposition is treated as calous and reactionary, for if Turchin is eventually permitted to leave the Soviet Union, the Council will argue that its actions did the trick; if on the

Letters to the Editor

Misplaced Concern

In recent letters David Fuller has expressed concern over what he considers the misuse of computers in producing statistics to support pro-abortion legislation [CW, Nov. 26, Oct. 8]. Once again we are reminded of the importance of women choosing fields where they can exercise some measure of control over their lives.

If Fuller had been in charge of producing the statistics, would he have twisted them or refused to produce them? Would his standards of morality be allowed to affect the lives of all those women?

Facts are facts, and producing them isn't taking sides one way or another.

Fuller's concern seemed pretty misplaced. Where was his voice of dismay when computers were programmed to pick two male jurors for every female one?

Mary Donlon
Newtonville, Mass.

Lend an Ear

I would appreciate it if someone who has an IBM songbook would contact me at the University of California Computer Center, Santa Cruz, Calif. 95064.

I am interested in getting a copy of a couple of the songs.

D. Van Tassel
Santa Cruz, Calif.

Mystique Debunked

In regard to Jerrold Asher's article ["Programmer Mystique

Can Enhance Professional Image," CW, Nov. 12], I can only say "bunk!"

If a programmer must wear a coned hat and a robe and maintain an aura of mystery to project a professional image, it is small wonder that recognition is slow in coming.

It is attitude and competence that marks the professional, not language and clothing.

Ted R. Burns
San Mateo, Calif.

Return to Normality

I have been reading *Computerworld* for about two years and could never figure out why, when I gazed at the front page, I always had the urge to run around in oblong circles and break into cold sweats for no apparent reason.

Well, this week's issue [CW, Dec. 3] caused no such bizarre behavior.

I owe this return to normality to Nathan Mark, who informed CW of the "zero" in its masthead. Thanks, Nate.

Noel Smith
Long Beach, Calif.

Computerworld welcomes comments from its readers. Preference will be given to letters of 150 words or less. *Computerworld* reserves the right to edit letters for purposes of clarity and brevity. Letters should be addressed to: Editor, *Computerworld*, 797 Washington St., Newton, Mass. 02160.

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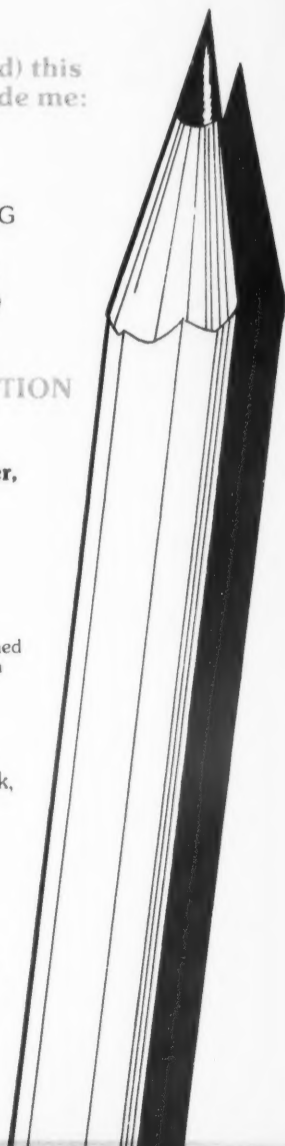
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Pinpointing Problems—Part 2

SMF Poor for Channel Time, Good for Disk Space Use

By Aso Tavitian

Special to Computerworld

The channel utilization of a program is directly proportional to the amount of data transferred through the channels (for a rotational position sensing [RPS]-type device or a tape drive). While System Management Facilities (SMF) does not measure the channel time directly, it usually provides information from which the channel time can be calculated.

The number of EXCPs multiplied by the block size (both obtainable through SMF record Types fourteen and fifteen) will indicate the amount of data transferred. By using the transfer rate of the device, the channel time can be calculated.

There are conditions, however, under which the information from SMF needed to calculate the channel time is inaccurate or incomplete. An accurate calculation of the channel time is impossible in such cases.

For instance, if the program whose

channel utilization is being measured uses program control interrupts (PCIs), the EXCP count from SMF is inaccurate, since SMF erroneously counts PCIs as EXCPs. Thus, the calculated channel time (based on SMF-recorded EXCPs) will be higher than the actual channel time. Some programs are known to cause four to five times more PCIs than EXCPs. The inaccuracy can therefore be substantial.

Another condition under which the channel time cannot be calculated from SMF-obtained data arises when the block size is not available in the records produced by SMF. This may occur when the program does its own I/O through EXCP or EXCPVR (e.g., a sort).

The use of the EXCP count as an indicator of channel time when the block size is not available can be quite misleading. For instance, 10 EXCPs of 13,000 bytes block size will use 1.63 times more channel time than 20 EXCPs of 4,000 bytes block size (10 times 13,000 divided by 20

$$(13 \frac{\text{kbyte}}{\text{track}}) (19 \frac{\text{track}}{\text{cyl}}) (400 \text{ cyl}) (60 \text{ min}) = 5.9 \times 10^6 \text{ kbyte-min.}$$

The use of an entire 3330 pack for one hour is determined by this equation.

times 4,000).

The device time represents the amount of time a program keeps busy the devices assigned to it. Tape drives assigned to a particular step cannot be used by other tasks until completion of the step (except in MVS versions of OS/VS2).

Thus, the device-busy time for a tape drive is equal to the elapsed time of the step. Since SMF provides the step elapsed time, determination of the device-busy time for a tape drive can be done accurately.

The device time for a disk drive, on the other hand, is difficult to calculate. It consists of three components for each I/O: seeking time (i.e., disk arm movement), latency time (i.e., the time required to locate the required block of

data once the disk arm has located the appropriate track) and data transfer time.

As discussed above, the data transfer time, which is the same as the channel time, can be calculated most of the time. The latency time averages to half a revolution time (8.3 msec for a 3330) per EXCP.

However, the seek time, which can be the greater portion of the device-busy time per EXCP, cannot be determined through SMF.

SMF provides no information about the amount of disk space traversed in a given I/O operation. Thus, SMF is useless in measuring the device-busy time for disk drives.

Disk space utilization is an area in which SMF provides all necessary information to make an accurate measurement. The disk space utilization should be calculated in kbyte/min to properly weigh the difference between a program which requires significant amount of disk space, but retains it for a short period of time and a program that requires less disk space, but retains it for a long period of time (e.g., 100 cylinders for 2 min vs. 10 cylinders for 120 min).

SMF provides start/end times of a job/step, the amount of disk space allocated, as well as both the time and amount of changes in the originally allocated disk space.

Such changes can be due to secondary allocation as well as release of unneeded disk space prior to completion of the job/step.

Thus, the disk space utilization in kbyte/min can be accurately calculated even when the allocated disk space is dynamically altered during the execution of the program.

Tavitian is president of Whitlow Computer Systems, Inc. in Englewood Cliffs, N.J.

Integrated DBMS Optional on 800 Line

DETROIT — Introduced earlier this month [CW, Dec. 17], Burroughs Corp.'s 800 series includes both hardware and software enhancements over the earlier 700 systems, but the company said the 800 systems are object code-compatible with the older ones.

Following the now-typical pattern of calming users fears while exciting their interest in the new equipment, Burroughs stressed the 800 systems provide "instant maturity" of system software and "instant transfer" of user application programs, apparently without so much as a recompilation.

An array of conversion aids developed for the 700s will also work on the 800s. These include, for example, utilities to convert IBM RPG, Honeywell Series 200/2000 Cobol, Univac Series 70 Cobol or BAL to Burroughs Cobol.

Other pieces of the 800 software repertoire are carry-overs from the 700 systems, especially from the announcement of the B4790 in October 1974. The Master Control Program (MCP-VI) — which Burroughs described as a multiprogramming executive routine — is functionally the same on the 800s as on the B4790.

Working with a scheme of dynamic allocation of main memory pioneered long before the term "virtual storage" came into vogue, MCP-VI now allows up to 256 programs to be executed concurrently if system resources are available.

MCP schedules jobs for execution and maintains tables of available internal and external storage, I/O devices and files available to the system, the company

said.

Capabilities of MCP-VI includes the Work Flow Management System, a scheduling and jobstream control facility. It takes into account user-defined deadlines and dependencies and produces a schedule of jobs in optimal sequence, including those which can or should be run concurrently.

A data base management system (DBMS) on the 800s, DMS II, is functionally identical to the system previously implemented on the large-scale models of the Burroughs 700 series. Unlike most data base systems, DMS II is integrated with the control program, MCP-VI, so that overhead is reduced and system throughput is sharply enhanced, Burroughs claimed.

A Cobol compiler designed to meet and exceed the 1974 American National Standards Institute specifications was also part of the 800 announcement package — and one that bears on DMS II. One of the extensions covers the data manipulation statements devised by Codasyl last spring to permit Cobol programs to work directly with data base systems.

Another feature of the compiler is a binding capability allowing users to write and debug small programs that can be compiled independently, then bound together at runtime into a large integrated system.

By working with the 1974 ANS Cobol requirements, Burroughs has also provided users with a range of "embedded" access methods not previously available, a

spokesman added.

A Cobol precompiler will be provided to Burroughs 800 users wishing to work with the Forte/2 data management system. Disk-based Forte/2 generates Cobol source code that is compiled along with the user's own code to create complete application programs working with the Forte/2-managed data bases.

Burroughs Time Analysis and Billing System (Tabs VI) has been modified to report resources used by the 800 systems. Output from Tabs VI can be used for charging usage back to end-user departments or to monitor and perhaps tune the application programs so they impose less of a burden on the system.

DMS II, though integrated with MCP-VI on the 800s, is separately priced, carrying a one-time charge of \$11,700 or monthly rental of \$1,073. The Cobol '74 compiler is available for \$50/mo, while Tabs VI costs \$35/mo, Burroughs said.

'Production Fortran' on GE Net

ROCKVILLE, Md. — Processing cost savings of up to 30% over Fortran IV for interactive production applications were the design goals of the Production Fortran (PFN) system now installed under Mark III service on General Electric's (GE) remote-computing network.

GE's previously available FIV is upward-compatible with PFN which, the company said, is "ideal" for use on proven, repetitively used programs currently running in core image or object

code.

Although it employs the same syntax as Fortran IV, compiler features that are unneeded with a stabilized program.

GE does not recommend that all FIV programs be switched to PFN. Those being used for development and immediate problem-solving situations should remain in FIV when line number references in error messages, warning messages and subscript checks are valuable assets, the company said.

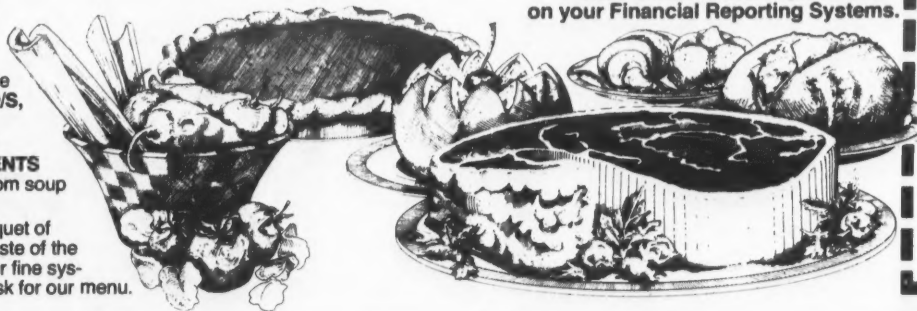
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Bon Appétit

LCP Avoids 'Structured' Terminology, Describes Problems in Terms of Data

By Peter Neely

Special to Computerworld

Within the DP community in the U.S., certain terms such as structured programming, structured design and top-down design have become the words of art which, either singly or jointly, are used to denote a "new approach" to programming.

These words do not appear in the book *Logical Construction of Programs* (LCP), yet this is the best and most readily comprehensible book on the "new

Concepts and Techniques

approach" I have yet seen.

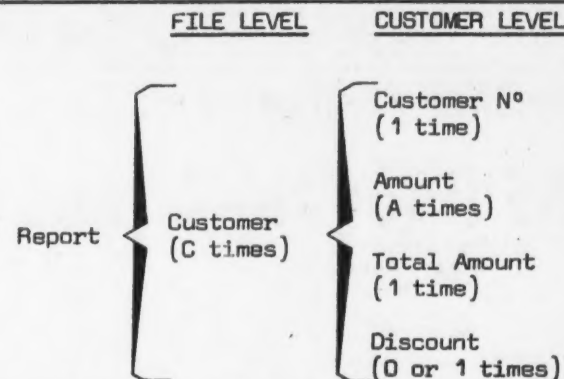
The words do not appear because the method, LCP, was independently invented by Jean-Dominique Warnier, an engineer with Honeywell Bull in France. As an engineer intimately knowledgeable with the logic of switching circuits, he brought that same logic to bear on the DP problem.

The key to bringing logic to bear on the DP problem is to totally describe the problem in terms of sets of data to be processed. Then simple set decomposition and Boolean algebra (of a set and its subsets) can be brought to bear on the solution of the problem.

There is no need to introduce programming linguistics or even to specify the programming language to be used in the coding of the problem.

The sets that are required are:

- Desired output (e.g., lines of print in a report, paychecks, etc.)
- Required input (as required for the computation of the output).
- Elementary functions that are required to convert input into output (e.g., how to compute a deduction). Since sets are unordered, it is also necessary to specify the order of occurrence of the sets and their elements.



Warnier pictures elements that may apply in one specific situation but not in another with a "1 or 0" occurrence count, as with the discount in this diagram.

For a given problem, either the input or the output may be the prime determinant of structure. The distinction between input and output is not made in the remainder of this review.

Also the input described is only that required to produce the output and does not refer to the total data base.

Also, the elementary functions involve only direct unconditional transformations (decisions are made in the program logic to determine the set that the current datum belongs to).

Given that all processing is to be described in terms of sets and subsets, the three constructs of structured programming are directly obtainable.

- Succession (impose order on unordered sets).
- Alternation (select a set or its complement).
- Repetition (to process all members of a set).

However, Warnier explicitly mentioned only the last two constructs. I prefer the term "selection" to "alternation," but that is my personal bias.

No other constructs are required. It may even be that invention of other constructs, which may obscure the simple logic inherent in the DP problem, is an error (proponents of the DO-CASE statement, please mull that over).

Overall Procedure

The overall procedure, then, is to fit a hierarchically organized description, in terms of subsets, to the data at hand. Consider the whole set of data as a single entity at the highest level of abstraction.

Subdivide that into subsets, each of which can be considered a single entity at the next level of abstraction.

Repeat this process for each of the subsets and continue the decomposition until the individual data elements are reached. To show this process, use set expansion diagrams.

Frequency of occurrence is generally indicated by 0, 1 or a symbol designating its repetition count.

For example, a report in which

some customers receive a discount might be diagrammed as in the accompanying chart, reproduced from the book.

The book should be studied with care. Put your coding sheets away and review Boolean algebra. Substantial effort will be required to put the ideas into practice.

Confirmation of Correctness

It is expected that correctness of decompositions will be confirmed. That is, whenever one is faced with a complicated decomposition (complex alternation), one should draw the corresponding truth table.

Then one should engage in two methods of simplification of the decision rules. The author suggests simplification by Boolean algebra and confirmation by use of Karnaugh maps.

Concerned With Efficiency

Also the author is concerned with efficiency. Suppose that two (or more) equivalent decompositions of the data exist. First, the fact of actual equivalence can be demonstrated by use of Boolean algebra (as opposed to reliance on programming linguistic constructs).

Then the efficiency of the two decompositions can be compared in terms of the repetition counts in the hierarchical structure. One can even examine the value of putting common tasks into a subroutine. Thus the DP task can be instrumented before a line of code is written.

For each problem presented, the set expansion diagram for the data is given first (if necessary, both for input and output), followed by a corresponding diagram for the program structure and then by a well structured flowchart.

One must at times be forgiving of the translation; it is very literal, and at times the English target word may be unusual (e.g., emolument).

Unfortunately there is no index.

Neely is a research associate at the University of Kansas Computation Center in Lawrence, Kan.

They're dedicated, but are they loyal, trustworthy and efficient?

A review of "Dedicated Systems" in our January 26th Supplement.

Many users - especially small and first-time users - face a serious dilemma in this age of escalating technology and escalating prices. They need computing power tailored to their needs to solve specific problems, but they don't have the resources or the staff necessary to develop a system of their own. Systems houses have been playing a significant role in helping users get around this hurdle, because they offer users the hardware, software and systems support they need in one readily available package. The customized configurations provided by the systems houses offer users a maximum amount of computing power with a minimum requirement for professional staff to operate and maintain the system.

In this special supplement we'll be taking an in-depth look at systems houses and the minicomputer-based turnkey systems they provide. And we'll be answering some very important questions like these: Who are these systems houses, and what do their services cost? What kinds of problems can they solve, and how do their solutions compare to those offered by the mainframe vendors? We'll review several case histories for specific applications, including tutorials on ways minis can be programmed to solve specific problems.

If you're involved with dedicated systems at your installation, or if you will be in the near future, then you should be reading this special supplement in the January 26th issue of *Computerworld*. And if you're a developer and marketer of turnkey systems, then you should advertise them here. Ad closing is January 9. Contact your *Computerworld* salesman for complete details. Or call Judy Milford at (617) 965-5800.



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For Low-Volume Application

User Adds Satellite Link Without Reconfiguring Net

By Ronald A. Frank
Of the CW Staff

STAMFORD, Conn. — The addition of a satellite link does not have to trigger the reconfiguration of a data communications network, even though many users assume the propagation delay associated with a satellite requires a full-duplex line-handling procedures with compatible protocols.

Some low-volume data communications applications can be run on satellite links

without being seriously affected by transmission propagation delays. That is the experience of Robert Stoutenburgh, who is in charge of telecommunications systems administration at Combustion Engineering, Inc. (CE).

When Stoutenburgh received a requirement to connect the office of a CE subsidiary, CE Lummus, in Houston, Texas, with a Univac 1108 in London, he decided to utilize a satellite circuit for the U.S. portion of the route.

The 1108 was also being utilized by the Lummus Netherlands office in The Hague, and both the Texas and Dutch offices were working together on a development project.

The Houston office has a Harris Cope 1200 terminal which emulates a Control Data Corp. User 200 terminal. Harris provided this capability because the emulation program allows the Cope 1200 to communicate with the 1108 CPU in a protocol similar to an IBM Hasp multi-

leaving discipline, Stoutenburgh said.

Data is being transmitted at 2,400 bit/sec between the Texas office and a CE office in Bloomfield, N.J. The American Satellite Corp. circuit ends at the firm's terminal in Dallas and a 4 kHz private line completes the link between Dallas and Houston. The Texas portion is provided by CPI Communications, an intrastate specialized carrier.

At 2,400 bit/sec it takes 2.5 sec to transmit a block of data, Stoutenburgh estimated. This includes .5 sec for the line acknowledgment and amounts to a 20% degradation over private land lines, he said.

But the slow transfer rate was not important because the Texas office was only transmitting about one hour of data each day. If the degradation was significant to the application, the transmission speed could have been upgraded to 4,800 bit/sec, he said.

For low-volume applications it was not necessary to switch from a half-duplex to a full-duplex protocol in spite of the delay, Stoutenburgh said. Also, a protocol change would have meant new terminal equipment.

Speed Worth Savings

While the line may be somewhat slower, the user said the cost savings is worth it. The American Satellite link costs about \$1,000/mo compared with an estimated \$1,700/mo that would be charged for a land-based private line, he said.

At the New Jersey office, the 2,400 bit/sec signal from Texas is combined with a similar-speed local circuit by a Codex multiplexer. The resulting 4,800 bit/sec data stream transmits the information to The Hague, where it is demultiplexed by another Codex unit. From there the data is sent at 2,400 bit/sec to the Univac 1108 in London.

The New Jersey office utilizes the local 2,400 bit/sec line to attach two Cope 1200 terminals into the network using Codex limited-distance line drivers.

Western Union International provides the transatlantic carrier facilities, and the network also includes a Cope 45 concentrator in The Hague.

The communications net is part of a software development project related to energy. Programmers at the Cope 1200 in Texas and at a Data 100 Model 78 terminal in The Hague are able to compare software steps over the communications facilities. The software is being jointly developed from both sites on the 1108 in London.

The satellite link has been in operation on the alternate voice/data network since last August without major problems, Stoutenburgh said.

ITTDTS Planning Packet-Switched Net

By Ronald A. Frank
Of the CW Staff

WASHINGTON, D.C. — ITT Domestic Transmission Systems, Inc. (ITTDTS) has applied to the Federal Communications Commission (FCC) for authorization to operate a data communications network that would allow noncompatible terminals to transmit data to each other or to noncompatible CPUs.

ITTDTS has proposed to establish and operate an interstate packet-switched digital data network providing store-and-forward services among others. The digital data communications net would integrate both packet-switching and store-and-forward techniques, the company told the FCC.

Com-Pak Network

To be called the Com-Pak network, the service will be composed of communications processors, CPU peripherals and interface processors linked by high-speed communications channels.

The nationwide network, scheduled to go into operation in June 1977 with 13 sites, will use carrier facilities provided by AT&T, Western Union, SP Communications, and the Data Transmission Co. In a later expansion phase, Microwave Communications, Inc. lines will be added.

Initially the network will utilize 9,600 bit/sec lines and 4 kHz voice grade lines, but 56K bit/sec circuits will later be added.

Com-Pak will at first offer transmission services between any types of facsimile devices. In addition, it will allow communications between data terminals, CRTs and teleprinters and these will also be able to communicate with facsimile devices.

Each category of service will be provided on either a priority or store-and-forward basis. An additional service is being developed to allow communications between mainframes and between mainframes and terminals, the firm said.

A Com-Pak user will be able to access

the network using either private or dial-up lines and charges for the service will consist of a monthly subscriber charge, acceptance and delivery charges, rates per message transmission and one-time installation charges.

The code, speed, protocol and modulation conversion capabilities required to allow noncompatible devices to transmit data to each other will be an integral and automatic network feature without a separate charge, the company said. Network rates will vary depending on the class of service selected by the user.

Three Levels of Service

For store-and-forward customers three levels of service will be available — priority delivery of information, which means within 15 minutes; regular delivery, which means within four hours; and overnight delivery.

Interactive customers will receive immediate, simultaneous transmission and reception of information.

The network will include 10 computer switching centers and 14 concentrator sites. Each concentrator site will be linked to one of the switching centers by analog facilities and the switching centers will be linked with each other using digital data lines.

FCC Asked to Rethink DAA Ruling

WASHINGTON, D.C. — AT&T has told the Federal Communications Commission (FCC) it should reconsider its decision to eliminate the Data Access Arrangement (DAA).

In a petition filed with the FCC, the phone company said a registration/certification program of the type adopted by the commission "cannot protect the network."

The registration rules adopted "are in many instances technically unsound and deficient in scope and need to be extensively revised [in order] to be work-

able."

Some of the universal interface criteria "plainly cannot be applied to certain types of equipment" and the rules must be modified accordingly, Bell said.

The requirement that phone company-supplied equipment be registered is not in the public interest and serves no legitimate purpose, Bell said.

In addition to AT&T, General Telephone & Electronics and Continental Telephone also asked for reconsideration of the registration ruling.

Talk to us about Couplers

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NCR Enhances Model 279

DAYTON, Ohio — NCR Corp. has developed an enhanced version of its Model 279 financial teller terminal with additional totals and communication modes for use in commercial banks, savings and loan associations, savings banks and credit unions.

The most recent version of the Model 279 terminal can be used in a free-standing mode and is upgradable to an on-line system, according to NCR.

In addition to capabilities available with other Model 279s, this version offers seven function totals for both the primary and the relief teller, seven batch totals which are shared by both tellers and three-digit activity counters for each batch total.

Three optional communications modes of operation are also available, including the ability to communicate to a central computer through the NCR 751 digital concentrator, through

an integrated modem or through an external modem.

In an on-line operation, the terminal can receive unsolicited messages from the central processor, NCR said.

Purchase price of the off-line version of the terminal is \$2,775; rental is \$93/mo and will be available in the first quarter, NCR said.

The off-line teller terminal can be upgraded in the field to include on-line capabilities at costs ranging from \$225 to \$500, depending on which communications capabilities are desired. All communications features for the terminal are field-installed or activated, NCR said.

Model 279 terminals now in use can be upgraded in the field to match the enhanced model's performance at costs starting at \$500, depending on the results desired, the company said here in Dayton, 45479.

Sycor Ecma-Compatible Devices Prepare Data for Small Systems

ANN ARBOR, Mich. — Sycor, Inc. has introduced two European Computer Manufacturers Association (Ecma)-compatible intelligent data entry terminals designed primarily to prepare data for small business computers, the company said.

The models 310 and 320 are said to have been approved for use with Honeywell, Inc.'s Series 62 and Sweda International's 1300 small business systems.

Both terminals are equipped with a CRT, typewriter-like keyboard, ECMA-compatible cassette recorder and micro-processor.

The 310 and 320 are also equipped with 8K bytes of read-only memory (ROM) and programs that control all terminal functions including format programs for specific data entry applications, arithmetic and checking operations, the collec-

tion of data on cassettes and communications.

The Model 310 includes one cassette recorder and may be equipped with an optional 3K bytes of random-access memory (RAM). This optional memory enhances the terminal's built-in error detection and arithmetic capabilities via the company's proprietary Terminal Applica-

Terminal Transactions

tion Language (TAL) for range checking, table look-up, multiply and conditional data entry, Sycor said.

The Model 310 can communicate using both binary synchronous communications at 1,200 bit/sec to 4,800 bit/sec rates and asynchronous procedures at 110 bit/sec to 1,200 bit/sec.

The Model 320 includes a second cassette recorder and provides input of stored format programs, tape pooling, selective copying of data from one cassette to another, storage of information for file search and retrieval and automatic transmission and reception of data, the company said.

The Model 320 communicates using binary synchronous procedures, it added.

Phase-Encoded Recording

The terminals' recorders use a phase-encoded recording technique and may write on both sides of the tape cassette, increasing the storage capacity from 240K char./tape to 480K char./tape, the company said.

The models 310 and 320 only provide interfaces for cassette recorders and communications, it added.

The Model 310 is priced at \$204/mo on a one-year lease and \$175/mo on a three-year lease; both lease prices include maintenance. The purchase price of the unit is \$6,380, Sycor said.

With an additional 3K bytes of RAM, the monthly lease is \$232 on a one-year lease and \$199 on a three-year lease. The purchase price of the Model 310 with RAM is \$7,180.

The Model 320 is priced at \$239/mo on a one-year lease and \$205/mo on a three-year lease, including maintenance.

First deliveries of both models are expected in January, the company said from 100 Phoenix Drive, 48104.

Clustered CRTs Share Same Teleray Printer

MINNEAPOLIS — Research, Inc. is offering its Teleray CRT terminals in clusters of two to six terminals with a common printer.

Individual terminal operators can select hard copy by pressing a button on the CRT keyboard. An indicator light on the terminal shows the printer is being operated by that particular CRT; other terminals in the cluster are not disturbed, the vendor said.

The Teleray printer has a 5 by 7 dot matrix and operates at either 110- or 300 bit/sec. It adjusts speed automatically to match the terminal in the cluster that is "asking" for hard copy, according to the company.

Standard options available to the clustered Telerays include composite video and space over data. The cluster comes with "daisy chain" cables for 12-ft separation between terminals and between printer and first terminal.

A typical five-terminal clustered system with printer costs "under \$9,000," a spokesman said, with delivery in 30 days. Research can be reached at Box 24064, 55424.

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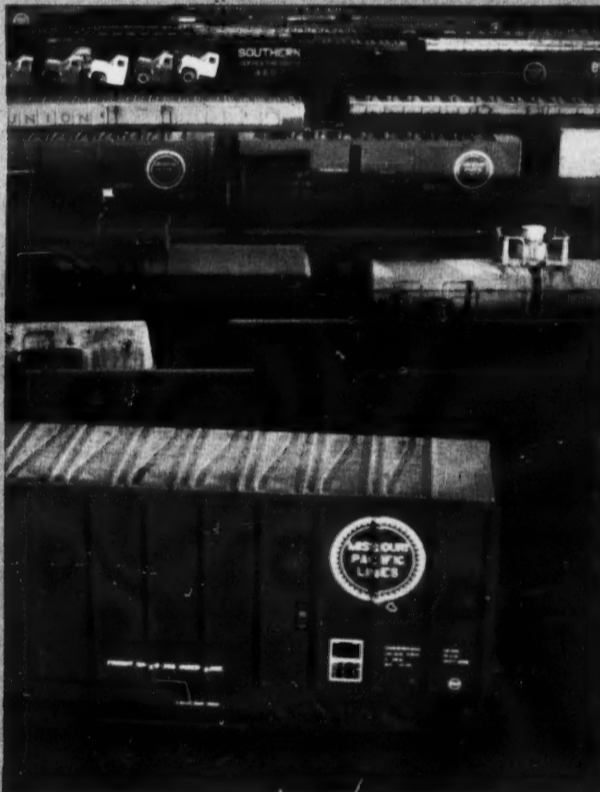


mo-pac

The tracks of the Missouri Pacific Railroad stretch nearly 12,000 miles... from Chicago to the Gulf Coast, from the Mississippi River to the Colorado Rockies. They carry an average of 475 trains every day, with as many as 100,000 railroad cars in use throughout the MO-PAC system at any given time.

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Take Chicago, for example. Using INCOTERM equipment, MO-PAC service representatives will be able to input waybills while still on the telephone with their customers. Because Chicago is one of MO-PAC's 126 reporting locations, INCOTERM will access and display data on the movement of all



trains throughout the system — and of each car passing through that particular terminal. And INCOTERM eases the transmission of administrative messages between Chicago and other points in the system by minimizing line time.

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Bits & Pieces

NMA's Annual Conference Set for April in Chicago

CHICAGO — The National Microfilm Association (NMA) will hold its 25th annual conference and exposition here April 27-30 at McCormick Place.

The event is expected to have over 100 exhibits and 166 speakers, the association said.

The conference will be preceded by two fundamental seminars for beginners: "Basic Data Processing" and "Fundamentals of Micrographics." All conference sessions will be designated for beginner, intermediate or advanced audiences.

The conference itself will open on Tuesday with a session on "Common Interests and Applications."

The following day will offer "Technology Reviews."

"Implementation" sessions will be offered on Thursday, and the conference will end on Friday with "The Future of Micrographics."

Registration information is available from the NMA Conference Department, 8728 Colesville Road, Silver Spring, Md. 20910.

Fabri-Tek Hikes Storage Unit Prices

MINNEAPOLIS — Fabri-Tek, Inc. has announced a 10% hike in the price of its Bulk Core Storage System, which is intended to replace the rotating drum storage units in Honeywell's GE/PAC 4000 process-control computer series.

"Even with the price increase, the system is less expensive and does not require the expensive periodic refurbishment associated with the drum storage it replaces," a Fabri-Tek spokesman said.

A typical 256K (word) Bulk Core Storage System sells for about \$60,000 from the firm at 5901 S. County Road 18, 55436.

GKI Cuts Tape Cleaner Cost

ROCKVILLE, Md. — General Kinetics Inc. (GKI) has lowered the price of its CE-70 magnetic tape cleaner/evaluator and said users can now order versions with fewer features for further saving.

The CE-70 can clean an 800-, 1,600- or 6,250 bit/in. tape and then write along the length of the tape. The CE/70 can then read back the data on the tape to check for errors.

About 30 selections and options are available, GKI said.

The price cut trims about \$250 from the previous \$7,000 to \$9,500 cost of a CE-70, a spokesman said. The less fully equipped models can reduce these prices by up to \$600 more, he added.

GKI is at 12300 Parklawn Drive, 20852

With Self-Threading Cartridges

User Reduces Tape-Mounting Time Lag

Special to Computerworld

SAN FRANCISCO — Since switching from an automated tape-retrieval system to a manual tape-storage system, Pacific Gas and Electric (PG&E) has speeded tape mounting and saved computer run-time.

That change, combined with hardware consolidation and a recent move to third-party leasing contracts, has helped cut PG&E's DP costs by 4% over the past 18 months — even though the company's computer use has climbed 17% in the same period, a spokesman said.

The manual system replaced a Supreme Equipment & System's Corp. Conserva-trieve automated tape library that the utility installed in 1970. The Conserva-trieve, with a built-in minicomputer, fed tape canisters to the tape librarian at the touch of a button.

While the automated device did not load the tapes onto drives, it did save the librarian a lot of walking and provided a high level of security and control, the spokesman said.

But by the spring of this year, the automated device was wearing out and reliability lapses were presenting a problem.



Pressing on a cartridge spring-activates it into position for removal from its storage rack.

At that point, PG&E decided the Easy-load tape cartridge concept had proven itself in commercial use and would suit its needs better than another automated system.

The Tab Products Co. tape storage

system PG&E installed suspends color-coded, self-loading tape cartridges from horizontal racks.

"The color coding all but eliminates misfiled tapes," the spokesman said. "Misplaced volumes stick out like a sore thumb."

The tape-handling facility includes EL II tape cartridges compatible with PG&E's self-loading IBM 3420 models 7 and 8 tape drives, the color-coded labeling system and a tape cartridge storage filing system.

"The operator loads the tape on the drive, cartridge and all, and the tape drive automatically opens the cartridge and threads the tape without manual intervention," the PG&E spokesman explained.

The time per reel change is 10 sec less than the previous approach. Based on the utility's 2,000-reel changes a day, the direct-loading cartridges reduce tape-mounting time by more than five hours daily.

Each self-loading cartridge has its own tape identification number affixed to the circumference of the cartridge; the identification is thus fully visible when vertically suspended in the racks.

PG&E personnel need not queue formerly used mechanical pickers at times of heavy activity, and librarians also don't have to remove tapes from canisters to engage or disengage write-enable rings or external labels when required.

Behind-counter access to the library is still controlled. Programmers are required to plan ahead since priority and sequence of jobs determine picking order.

A computerized tape-management system also cross-references tape identification numbers with job name and identifies purge dates.

Device Reads Two Card Types

BLUE BELL, Pa. — A version of the Univac 0716 card reader that can handle

both 96- and 80-column cards has been introduced for use with Univac's 90/30 computer system.

The Univac 0716 previously handled only 80-column cards. The dual-reading version allows IBM System/3 users to upgrade to the 90/30 with the option of retaining 96-column cards and their prior data entry equipment, Univac said.

Operators can quickly switch the dual-reading version from 96- to 80-column modes, Univac said.

The 80/96 column reader is available for the 90/30 in 600 card/min or 1,000 card/min versions. It can be upgraded from the lower to the higher speed.

The dual-mode version 0716 provides a single input hopper with a capacity of 2,400 80-column or 2,000 96-column cards. Each of two output stackers handles up to 2,000 cards. An optional feature allows for handling 51- and 66-column short cards.

Prices for one-year rentals are \$421/mo plus \$102 maintenance for the 600 card/min reader and \$490/mo plus \$146 maintenance for the 1,000 card/min model. Lower prices are available with longer term contracts.

Purchase prices are \$20,208 for the lower speed and \$23,520 for the higher speed version.

Univac said the dual-mode 0716 will be available early in the second quarter.

Telex to Offer 3350-Type System

TULSA, Okla. — Telex Computer Products, Inc. will offer a high-capacity disk subsystem compatible with IBM's recently announced 3350 disk subsystem, the company said.

The drives will be built by Univac's Information Storage Systems.

Called the Telex 6330-12, the subsystem will provide the same 317M-byte storage capacity as the IBM 3350, but will also offer a movable pack as well as attachment to certain 360 systems and nonvirtual 370s.

Telex's current 6330-10 and 6330-11 100M-byte and 200M-byte subsystems can be field-upgraded to the 317M-byte 6330-12 system.

Telex said it will offer a variety of lease plans to facilitate this upgrade flexibility and assure "major savings" vs. the equivalent IBM products.

Deliveries of the 6330-12 will begin in early 1977 from the firm at 41st and Sheridan Road, 74101.

With our Video 100 you don't need a ton of paper to debug a program.



Debugging a program with hard copy can be tough. You can't get to the bottom of the problem 'til you get to the bottom of the heap.

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Yet for all its bigness, there is one small feature in the Nova 3. Price. You can get a 64K word MOS memory Nova 3 with Memory Management Unit, Automatic Program Load and Power Fail Protection for just \$16,800* (Or a smaller Nova 3 for an even smaller price. A 4K MOS system for \$2,600*.)

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Mini Bits

Plessey Has 16-Bit Micro With 350 Nsec Cycle Time

SANTA ANA, Calif. — A 16-bit microcomputer with a cycle time of 350 nsec and 82 instructions, including multiply and divide, is available from Plessey Microsystems.

The Plessey Miproc 16 is configured for parallel fetch and execution with two separate program memory and data memory architecture so most instructions take a single cycle. Conditional branches take 700 nsec and multiply/divide times are 5.6- and 11.2 μ sec.

The micro is supported by a prototype development system and a Fortran IV cross-assembler and simulator for use on the Tymshare and GE Mark III networks.

The system, which includes chassis, CPU, front-panel logic, 1K or high-speed bipolar random-access memory, .5K read-only memory, paper tape reader and power supply, costs \$5,000 and is available from the firm at 1674 McGaw Ave., 92705.

ICP-700 Configured for Accounting

DALLAS — A small business computer system for general accounting use has been introduced by International Computer Products, Inc. (ICP) here.

The ICP-700 has a base price of \$12,500 and the basic system includes a CRT display and keyboard, 16K MOS memory, three cassette drives or two floppy disk drives and a console.

The system is also offered with a variety of line printers, fixed-disk drives, up to 64K memory, typewriters and communications devices, the firm said.

The system comes with four basic general accounting software packages, including payroll, inventory, order entry and general ledger, and there is a library of application software, according to the firm at 2925 Merrell Road, 75229.

Disk Controller Fits Novas

ANAHEIM, Calif. — A single-board disk controller that allows both multidisk, single-platter drives and cartridge drives to be used with Data General Nova and Data General-emulating computers is available from Western Peripherals, Inc.

The unit, called the DC-220, controls as many as four single-platter cartridge drives, two dual-platter drives, two single-platter drives with 406 track/surface or a single dual-platter drive with 406 track/surface.

It can also control two 10-disk platter drives, Western Peripherals said.

The DC-220 costs \$2,500 from the firm at 2893 E. La Palma Ave., 92806.

By Mal Stiefel

Special to Computerworld

SAN FRANCISCO — Minicomputer users often lack the expertise needed to get their special applications running and must rely on self-education and a software designer who knows his business.

In one small shop here, an accountant uses a disk-oriented Varian Data Systems 620/E for general ledger, payroll billing and statistical analysis.

The user began searching for a replacement for his Monroe magnetic card bookkeeping system in 1971. He was looking, first of all, for an approach to selecting a computer system.

He rejected the alternative of a service bureau because he didn't want sensitive client data to leave the office.

When the University of California offered a short "Mini vs. Maxi" extension course, with lecturers from hardware manufacturers and from industry, the accountant attended, gaining enough insight to develop a bid package that embodied his requirements.

Several manufacturers were invited to submit proposals, but only Xerox Corp.'s Data Systems Division (DSD) and Varian responded. The Varian entry won out at

\$25,000, about "half the price" of the DDS unit.

The system, with 16K bytes of core, a card reader, line printer and two small disk drives, was installed in 1972.

More core, bigger disk drives and a tape drive were added as the workload grew, bringing total hardware cost to \$100,000. Varian handled maintenance from the beginning and current maintenance costs are \$1,054/mo.

Searched for Help

When the system was first purchased, the user searched for help to develop the initial general ledger and payroll packages.

Varian had no business-oriented application programs then, and it couldn't recommend any software supplier in the area.

On his own, the user found a knowledgeable programmer/analyst in a local software house to design and implement the programs.

The software house failed subsequently, so the user hired the programmer as a consultant to continue the work. The programmer had access to the ac-

countant's system for software development and a license to market the completed packages independently.

Programming began in RPG-II, but they quickly switched to Fortran and machine language after finding RPG-II too restrictive. The programmer later put together an Indexed Sequential Access Method route, married to Varian's Vortex operating system and a sort/merge utility.

The programmer continues to maintain the utilities and the application programs, supplying upgrades without charge. Thus far, the user estimates that all software has cost about \$30,000 over the life of the system.

Today, the system handles general ledger, payroll, billing (of the accountant's clients) and a sophisticated statistical package developed for a law firm.

The latter provides the lawyers with a complete analysis of the number of hours of each class of labor (legal, secretarial, etc.) worked for each client every month as an input to their billing procedure and an analysis of legal staff and support staff productivity each month.

Final bills are figured by hand, because the computer doesn't carry all of the exceptions and special arrangements made for each client.

The machine is used five days a week, 12 hours a day. There's a full-time operator, a full-time keypuncher and two control clerks who run the computer in the morning before the operator arrives.

The user, who asked not to be identified, said getting the programs into operation took longer than he anticipated, but he said he's happy with the software and hardware.

Additional developments are being studied, including a text editing package which will require CRT terminals, and packages oriented toward specific groups of clients such as trustees of estates and foundations.

Mod Five Upwardly Compatible With DCC D-116 Minicomputer

FAIRFIELD, N.J. — The Digital Computer Controls, Inc. (DCC) Mod Five is said to be upwardly compatible with the firm's D-116 minicomputer.

The firm has filed an appeal staying a Delaware Chancery Court injunction that would have barred the company from manufacturing and marketing the D-116 [CW, Dec. 10].

"The Mod Five machine was in the works for some time," a DCC spokesman said. "We find it appropriate to release the machine at this time. We have no intention of dropping the D-116 from our line."

Existing controllers and software developed for the D-116 and D-116H will also run on the Mod Five, the company said.

Mod Five features include an extended single-word instruction set, overlapped instruction fetch concurrent with the execution of instructions, triple stack processing and a vectored interrupt system, the firm added.

Operating systems include RTX, a real-time executive; MSOS, a mass storage operating system for real-time and batch operations; and EOS, a business and scientific operating system.

The system is available with a 4- to

17-slot chassis and can have 800-, 1,000- or 1,200 nsec cycle times. All peripherals for the current D-116 system are available for the Mod Five.

Prices for the Mod Five are equivalent to D-116 prices, a spokesman said. They range from \$2,975 for a CPU with 4K 16-bit words and a 4-slot chassis to \$29,270 for a CPU with 128K words of memory and a 17-slot chassis.

IBM Trying 5100 Purchase Plan

ATLANTA — A three- to six-month lease/purchase test plan for the IBM 5100 has been announced by the corporation's General Systems Division here.

The plan allows the potential customer to try the 5100 for 90 days before purchasing the unit. An additional 90-day extension is available.

The customer has the option to buy any time during the trial period, with up to 70% of the lease price applied to the purchase price, according to IBM. The contract may be canceled only after the full three-month period, a spokesman said.

The plan includes IBM maintenance

coverage.

The purchase test plan price for three months for an IBM 5100 with Basic and 16K bytes of main storage is \$1,350, IBM said. The purchase price for that system is \$8,975.

Test plan price for the 5100 with both APL and Basic and 64K bytes main storage is \$3,000 for three months. The system costs \$19,975 to buy.

Also announced was a serial I/O adapter that permits the attachment of CRTs, paper tape units, plotters, card reader/punches and printers to the 5100. The adapter costs \$700 or \$105/mo under the three-month plan.

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Better Use of Capital Possible

RJE Helps Firm Keep Vigil Over Catalog Inventory

NASHVILLE, Tenn. — When a company runs 30 showrooms in 11 states scattered in the Southeast and Midwest, controlling inventory requires constant vigilance. This is where a mini-based remote job entry (RJE) system enters the picture at Service Merchandise Co., a large catalog showroom.

About three years after it was founded, in 1962, a service bureau data processing system was

set up.

Over the years, DP has constantly been upgraded, both in the home office and in the field.

The operation, under David Greenberg, operating vice-president for DP, contains a Honeywell 2050 with 192K core storage, 900M-character on-line disk storage, four tape drives, two printers, two readers and a front-end processor with both in-house inquiry and communica-

tions with the showrooms by means of a 2780 emulator package.

Early this year, the company installed the Micos mini-computer system developed by Mini-Computer Systems, Inc., which provides in-house time-sharing and two-way RJE.

The Micos configuration consists of a Data General Corp. Nova 2/10 with 65K-byte capacity, a 10M-byte disk drive,

three 8-line multiplexers for on-line showroom terminals and printers and a bisynchronous communications controller.

The Micos base is the complete Service Merchandise catalog on file in the disk, currently totaling around 27,000 items.

Data includes all inventory quantities, stock movement history, pricing and pointers to alternative products if the product desired by the customer is out of

stock. Each item is uniquely accessible by catalog number or by its six-digit point-of-sale number.

Basic Function

The basic function of Micos is to accept customer orders from the cashier-operated CRT station and to determine, through direct inquiry, whether the item is in stock.

Currently there are 12 CRTs and three printers in each of two showrooms — one Nashville outlet serving as a prototype close to home and one in Charlotte, N.C.

Once a catalog number and quantity are entered, the price is determined, the location of the items is reported, stock level is checked and decremented and the information is returned to the CRT.

When the order is totaled, a release is printed in the warehouse to have the merchandise picked from the shelf and sent by conveyor belt to a customer pick-up area.

If the item is out of stock, the customer is offered the model on display or can select from a list of alternatives provided on the spot.

Nightly Report

During the night, the Honeywell system in the home office receives a detailed report of the day's activity, which is processed for the combined inventory report that is run every night.

On designated days, the system will call back, sending to the Micos system file all additions of goods, catalog number changes and price changes.

Service Merchandise intends to install Micos systems in all its showrooms. Greenberg sees each such location eventually functioning as a self-contained operation, handling not only the current duties, but others such as vendor debts, bad checks, mailing lists, etc.

There is also the distinct possibility that the Micos system will take over the cash register function some day, he said.

Intel Has Add-On For 7/16 Minis

SUNNYVALE, Calif. — An add-on semiconductor memory system for the Interdata Model 7/16 Basic minicomputer has been introduced by Intel Memory Systems.

The In-4716 system stores up to 16K 17-bit words on a single card and up to 32K words on two cards.

The system can be used in the same minis as core memory modules, Intel said.

The In-4716 has a 300 nsec access time and a 1 μsec cycle time.

The basic single-card system is available in three versions storing 8K, 12K and 16K words. Each card is a complete system, with all control, refresh and interface logic, according to the company.

At 16K, the In-4716 costs \$1,985 and is available from the firm at 1302 N. Mathilda Ave., 94086.

DATA DIMENSIONS INTRODUCES THE RENTABLE DECwriter II... WITH MAINTENANCE BY DEC.

As little as \$65 a month, including maintenance by DEC. Many other options, too. Even a \$45 monthly, 5-year lease/purchase plan. And an unbeatable cash purchase plan.

Now, you can have the printer terminal that's three times faster than teletype for little more than the cost of teletype. Data Dimensions, Inc. makes this possible through a new purchase/maintenance agreement with Digital Equipment Corporation. The agreement enables us to provide DECwriter II data terminals to computer users across the nation through a variety of rent-or-buy options. Take your choice:

1. **THE DDI RENTAL PLAN:** options range from \$95 a month for a single, standard LA 36 unit on a one-year lease to as low as \$65 a month. And full on-site maintenance is included in your monthly rental!
2. **THE DDI LEASE/PURCHASE PLAN:** rates range from \$70 a month over a 2-year period down to \$45 a month. And at the end of the lease, you can own the machine for one dollar! By agreement, maintenance is available from DEC at standard rates.
3. **THE DDI PURCHASE PLAN:** you can buy a single unit from Data Dimensions for \$1695, or buy in quantity and gain substantial discounts.

This program is one example of why you can count on DDI to bring you the best — in performance, maintenance and price. We are one of the largest suppliers of data communications equipment in the nation. We have the buying power to seek out the best buys for you. And because we carry a complete assortment of terminals and other communications equipment, we have no axe to grind — we provide the equipment that best serves your needs and budget.

We might or might not recommend a DECwriter II for your operation. If we don't, it'll be because we can give you even better cost efficiency another way. Challenge us. For more information, write: Data Dimensions, Inc., 51 Weaver Street, Greenwich, Conn. 06830. Or better yet, call Bob Loonin at (203) 661-1700.



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HOW MANY SALES LEADS DID THIS AD PULL?

Guess right and you win a rent-free DDI 265 portable terminal for three months!

Here are 3 clues:

1. This ad appeared in *Computerworld*. Rudy Menna, President, Data Dimensions' Equipment Division, thought the ad might pull 30 replies. Total.
2. The first day it generated 36.
3. Three months later, Rudy was still getting inquiries.

Some more clues:

If you know the terminal market, you know Data Dimensions, Inc. only handles winners. More than a traditional leasing company, DDI performs comprehensive evaluations of manufacturers' products to insure that they'll meet your needs. DDI's product line offers you a complete remote communications capability.

Next clue: DDI wanted to reach every possible interested person with news of their new product, so they chose the newspaper for the entire computer community, *Computerworld*.

Response was immediate. Inquiries came from computer professionals in every type of business — including universities, banks, hospitals, government, insurance companies, and manufacturers of food, drugs and cars. Resulting sales were excellent.

Was it just a lucky first shot? Not at all. DDI repeated the ad, and got even better results.

Guess how many leads the first ad produced, and DDI will install the industry's most reliable portable terminal — yours to enjoy for three months, with NCR service included — all at no cost to you!



COMPUTERWORLD

Roy Einreinhofer, National Sales Manager
Computerworld
797 Washington St., Newton, Mass. 02160

Sure I'd like to have the portable terminal rent-free for three months.
My guess is the DDI ad pulled _____ sales leads.

My name _____

Title _____

Company _____

City _____ State _____ Zip _____

CI Notes

Honeywell, Xerox Powwow Over Manufacturing Rights

EL SEGUNDO, Calif. — Honeywell, Inc. is negotiating for manufacturing rights to Xerox computers in addition to the sales and service agreement originally announced by the two firms [CW, Oct. 22].

This "new element" has extended current negotiations beyond the Dec. 1 completion date originally projected, but a contract is expected to be signed "before the end of the year," a Xerox spokesman said.

A source indicated Honeywell does not intend to assume operation of the Xerox manufacturing plant here but would probably want to set up its own manufacturing operation in one of its own facilities, perhaps in Phoenix.

Intel Discontinues 360 as Planned

SAN FRANCISCO — Intel Corp. has completed the discontinuance of its IBM 360 leasing activities on schedule without any need to adjust the \$30 million already charged against 1973 results.

Sycor 440 Orders Total \$6.5 Million

ANN ARBOR, Mich. — Sycor, Inc. has amassed over \$6.5 million in orders for its 440 clustered terminal processing system, introduced three months ago.

Most of the orders came from current Sycor customers "who wish to integrate their existing Model 340s and 350s into a common user information network," according to Paul C. LaVoie, vice-president of marketing.

CSC Forms French Link

EL SEGUNDO, Calif. — In a move to gain access to major systems development contracts with the French government, Computer Sciences Corp. (CSC) has agreed to sell a majority interest in its subsidiary, Computer Sciences International France, to a subsidiary of Thomson-Brandt.

CSC President William R. Hoover said the association with Thomson will enhance the unit's ability to address major opportunities for systems development for the French government.

SEL Nets EAI Order

FORT LAUDERDALE, Fla. — Electronic Associates, Inc. (EAI) has agreed to purchase about 100 Systems Engineering Laboratories, Inc. (SEL) 32 series computer systems over a multiyear period.

EAI's first order, valued at \$1 million, specified initial deliveries during the first quarter.

The SEL equipment will be integrated into EAI's fossil fuel and nuclear power plant training simulators as well as large-scale hybrid computer systems also manufactured by EAI.

Supershorts

The Memory Systems Division of Intel Corp. has named Sorbus, Inc. and Telex Service Corp. to provide maintenance services in the U.S. and Canada for the division's line of add-on memory products for IBM 370 computers.

Shugart Associates has signed a five-year license agreement allowing Matsushita Communication Industrial Co. to manufacture and market its flexible disk drives in Japan. The agreement is subject to approval by the Japanese Ministry of International Trade and Industry.

Report on '74 Indicates

User Loyalty Remains at All-Time High

By Molly Upton
Of the CW Staff

WALTHAM, Mass. — Customer loyalty remained at an all-time high during 1974, possibly due in part both to the advanced life cycles of computer generations and to the rocky economy, according to *EDP Industry Report* (EDP/IR), a newsletter from International Data Corp.

Compared with 1973, a smaller percentage of each vendor's customer base chose to replace CPUs, and signs indicated the same held true for the absolute number, EDP/IR said.

"Such a stay-at-home trend could easily be interpreted as caution in the face of product lines passing their prime," the newsletter added.

Since the ratio of computers in single-vendor sites vs. mixed-vendor sites was higher in 1974 than in 1973, EDP/IR concluded "the mixed sites seemed to be pruning vendors."

IBM, DOD Planning Sales Pact Some See as Move to Evade GSA

By CW Staff Writers

WASHINGTON, D.C. — IBM, which missed the filing date for inclusion under the federal Automated Data Processing (ADP) Supply Schedule, has drawn up a proposal with the Department of Defense (DOD) for equipment sales that observers fear could be an end run around the General Services Administration's (GSA) central authority over DP procurements. The proposal is a "mirror" of the schedule IBM would have filed with the GSA had it been done on time and includes equipment for both domestic and overseas locations, a government source indicated.

Theodore Puckorius, GSA's commissioner of automated data and telecommunications services, said no contract has been approved, but he confirmed the GSA has issued a delegation of authority to the DOD that enables it to establish an "indefinite quantity contract" permitting its agencies to acquire equipment from IBM.

However, Puckorius emphasized the contract allows DOD to purchase equipment "only after all other procurement requirements, including competitive bidding, have been met."

DOD requested the contract to eliminate the need to write "potentially thousands of separate contracts with IBM," Puckorius explained.

The GSA has asked DOD for a cost justification of its proposal with IBM.

Undermines Brooks Act?

Observers are concerned this proposal, if approved by the GSA, could undermine the Brooks Act, which was designed to encourage competitive bidding on DP procurements.

The procedure being implemented between IBM and the DOD is "antithetical with the open competition provided under the Brooks Act," the government source said.

The precedent that could be set by this pact is serious because it could mean a fracturing of the GSA's central authority over DP procurements, he said.

The GSA will have a hard time holding other firms to the deadline for supply schedules, he added, because the pact encourages every agency to make its own schedule.

"If the IBM-DOD schedule pact is allowed, the government's largest procurer of computer equipment could con-

ceivably sole-source millions of dollars worth of equipment and thus effectively squelch the competitive procuring process," the Computer Industry Association (CIA) said.

If the GSA approves the contract, "it will in effect grant DOD an authority that is not permitted the government as a whole," the CIA told the House Government Operations subcommittee.

The CIA has filed for a copy of the contract proposal between DOD and IBM under the Freedom of Information Act in order to learn the details.

Rep. Jack Brooks' (D-Texas) Government Operations Subcommittee has asked the DOD and the GSA to explain the terms of the proposal and the rationale behind the proposal.

Because IBM missed the Supply Scheduling filing deadline, the GSA made a limited contract with IBM to protect its existing IBM leased installations.

For 1975, IDC forecast Burroughs' loyalty will climb to 91% in 1975, and

NCR's to 85%, while Univac will jump to 85%.

However, HIS should continue to fall, to 73%, and IBM will decline to 92%.

The "other" category will climb to 60% in 1975, according to EDP/IR predictions.

Based on 773 Sites

The forecast was based on 773 sites vs. 1,098 for the previous year's forecast.

The loyalty percentage was calculated by dividing the number of customers reordering from a vendor by the sum of customers reordering from a vendor and customers lost to competitors.

The study did not include first-time users and was limited to general-purpose computers, which does not include most minicomputers.

In comparing activity at mixed- vs. single-vendor sites the survey, which examined 3,356 single-vendor sites, showed NCR led with a ratio of 10:1 single- vs. mixed-vendor sites; followed by IBM, 4:1; Burroughs and Univac closer to 2:1; and HIS at 1.3:1.

Heavily weighted by the IBM average of 4:1, the overall installed base of single-vendor sites was 3.5 times that at mixed sites, EDP/IR said.

Equipment Value at Sites

The value of equipment at single-vendor sites rose six times more than at mixed sites during 1974. NCR and Univac saw a decrease in mixed site value.

Equipment at IBM's single sites increased in value seven times more than at mixed sites, and Burroughs' and HIS' single sites increased twice as much, EDP/IR said.

"At the beginning of the year, the installed value of IBM sites to receive computers in 1974 — whether of IBM or other origin — was 22% of the entire IBM base," the report said.

Other firms had about 15% to 16%, IDC said.

Compared with 1973, 1974 was a "sluggish year" the report said, with more activity at mixed-vendor sites. The overall base, mixed- and single-vendor sites, turned over nearly 4% more in 1973, according to the study.

GSA Changes T/S Bidding Rules

By Nancy French
Of the CW Staff

WASHINGTON, D.C. — The General Services Administration (GSA) has decided to drop its proposed "discount benchmarking" plan for buying time-sharing services in favor of a "basic agreements" proposal that will allow vendors to qualify before discussing price, Theodore Puckorius, commissioner of GSA's automated data and telecommunications services, said in an interview here recently.

Vendors had objected to the earlier plan, which would have granted contracts only to firms that matched the highest discount offered by any firm in the competition [CW, July 30].

Under the basic agreements proposal, all vendors wishing to do business with the government have to meet a set of master terms and conditions covering such things as maintenance response time, uptime, and billing procedures, Puckorius said.

Firms willing to meet GSA's terms will be placed on a "prequalified list" of companies that could number as many as 60 vendors. Those offering similar services will be grouped together in the "Sears catalog" of time-sharing services GSA envisions, he said.

It will be up to the individual agency

seeking service to assure through standard competitive solicitation it is getting the lowest possible price, he said.

Firms that make the list will include all types, ranging from small local service bureaus to national organizations offering a full spectrum of services, Puckorius said.

"I don't like the plan — it's still going to take too much paperwork on the part of the agencies involved, but it's the best one we could come up with," he admitted.

Preparation of requests for proposal (RFP) will be simplified through the use of short "check-list" order forms, he said.

A contract worth \$10,000 to \$25,000 will be boiled down to a one-page solicitation document, and three bids will be required, he explained. Orders of \$250,000 or more will require a full-blown solicitation, with publicity in the *Commercial Business Daily* to assure fairness, Puckorius said.

The present time-sharing contract held by Computer Science Corp.'s Infonet Division expires July 1, he noted.

Although prices were increased under that contract by 5% this year, volume discounts have offset the increase to date, he said.

Tandem Aiming at 'Undominated' Sector of Market

By Molly Upton
Of the CW Staff

SANTA CLARA, Calif. — Add one more to the number of mainframe manufacturers.

The year's latest entry, Tandem Computers, Inc., has targeted a market slice it figures is less than 5% of any existing mainframer's business, and it stands a good chance of dominating that slice, according to Jim Treybig, Tandem president.

Armed with venture capitalists' backing to the tune of \$3 million to date, the firm has a prototype of its Tandem 16 Non-stop system [CW, Dec. 10] and plans its first shipment April 1.

The Tandem system is aimed at the sophisticated end user who is tackling the problem of tying together two or more systems to provide a redundant capability, Treybig said.

The redundant systems market cur-

rently accounts for about \$250 million in annual sales and is growing at about 30% a year, according to Sam Wiegand, the firm's vice-president.

The market should grow to about \$800 million a year over the next five years, and the advent of Tandem's standard system will serve as a solution to the previously required custom programming of operating systems, he said.

"We're looking for the sophisticated end user who is looking for a system that will enable him to put his business on-line" and on which he can depend, Treybig said.

These users typically want to write their own applications programs, he said, adding one of the major advantages of Tandem's approach is an operating system, specifically designed for multiple processors, that can be up and running quickly after installation.

"Indirectly, "we're competing against

every computer manufacturer," Treybig said.

Although he anticipates other firms will promote the same type of machine, he said he didn't think any others had anything similar under development now and would have to start from scratch.

Treybig said during the first year of shipments, Tandem could ship about \$5 million worth, which he estimated would be between 35 and 50 systems.

Tandem's biggest market is probably financial institutions, he said, with others being communications-oriented companies, retail firms and industrial automation.

Initially backed by the venture capital firms of Kleiner & Perkins and Asset Management for \$1 million, Tandem recently completed a \$2 million round of private financing from Kleiner & Perkins, Henry Hillman, the Mayfield Fund, Data Science Ventures and Warburg-

Pinkus.

To talk its way into funding, Tandem's concept had to offer a cost advantage to customers, increased system reliability and "functional failure modes," Treybig said.

The firm has experienced "no major problems so far," he said. All system test and integration software is done, and the firm is ahead of schedule and has spent less money than anticipated, he said.

The management is comprised principally of former managers from Hewlett-Packard (HP), some of whom also were at Kleiner & Perkins and Diablo Systems.

Treybig was formerly a partner in Kleiner & Perkins and, before that, marketing manager for HP's Cupertino, Mountain View and Data Systems divisions.

James A. Katzman, vice-president of engineering, headed the design team responsible for one of the four primary modules in the Amdahl 470 and was also one of the principal architects of the HP 3000 system.

Michael D. Green, vice-president of software development, held several software development posts at HP.

Still another former HPer is John C. Loustaunou, vice-president of finance, also formerly a partner in Kleiner & Perkins. Loustaunou served as finance and cost accounting manager of the HP Data Systems Group.

Sam Wiegand, vice-president of marketing, and Robert Marshall, vice-president of manufacturing, each held similar positions at Diablo.

David R. Mackie, product manager, who held marketing and development management posts at HP, and Horst Enselmuller, managing director of Tandem GmbH and most recently responsible for HP's computer sales in Germany, complete the management team.

Tandem is opening sales offices with DP centers and service staffs in three locations: New York City, Chicago and San Francisco, and a subsidiary, Tandem GmbH, in Frankfurt, West Germany.

CMI Reshuffles Management After Year Ends in the Red

BEDFORD, Mass. — Promptly after revealing a loss for the year ended Aug. 31, Cambridge Memories, Inc. (CMI) reshuffled management and brought in a new president, Jerry E. Goldress, who will also serve as chief executive officer.

Goldress is a principal in the firm of Grisanti & Galef, Inc., a business and management consultant firm.

Joseph F. Kruey, formerly CMI president, has been named chairman of the board.

CMI showed a loss of \$4.1 million in the year ending Aug. 31 compared with earnings of \$1 million in the preceding year [CW, Dec. 17].

Survey Finds Big Hospitals Prone to Lease DP Devices

NEW YORK — The nation's largest hospitals are more likely to lease DP systems than any other type of equipment, according to a survey of community hospital financing practices conducted for Citicorp Leasing, Inc.

The survey of 447 nonfederal, short-term health care institutions of 50 beds or more showed that the larger the hospital, the more likely it is to lease its DP systems.

Seventy-one percent of hospitals with 500 or more beds lease DP equipment. The leasing incidence is 68% in 400- to 499-bed hospitals and 65% in the 300- to 399-bed category, the survey said.

Fifty-four percent of hospitals in all size groupings lease DP equipment, the survey showed.

Don't just wish you had.

Upgrade your skills now with the EDP Seminar Series.

In today's tight-fisted economy the pressure is on every data processing department to improve efficiency and cut costs. That's why Computerworld sponsors the EDP Seminar Series - to bring you the detailed information you need in a concentrated, practical form.

Each of our seminars is structured for immediate, practical application at your own installation. You'll gain a basic understanding of the material in lecture and review periods, and then you'll go on to apply what you've learned in the open book workshops. You'll be learning by doing in a shirtsleeve environment while you enjoy the interaction and interchange of experience with your peers. And you'll gain from the experience of the seminar leader, who will personally direct every phase of the course work.

All of our seminar leaders are nationally prominent experts in their specialty of data processing. They are experienced both in implementing their techniques to solve real-world problems and in presenting these advanced methodologies to business, government and industry.

So put the Seminar Series to work for you. Whatever your specialty, they'll sharpen your skills - and show you the pitfalls to watch out for, so you can avoid making costly mistakes. They can benefit your installation, your organization - and you.

A list of current seminars is given below. To register for any seminar, or if you'd like more information, just check the appropriate box and send in the coupon.

How to Increase Programming Productivity

A 2-day seminar for technical managers on the state of the art of Software Engineering. Led by John W. Brackett, PhD, Vice President of SofTech, Inc., and Clement L. McGowan, PhD, Consultant. Fees: \$300, including continental breakfasts, luncheons, and all course materials. \$250 for additional registrants from the same company. Schedule:

New York	Essex House	Jan. 26-27
Chicago	Hyatt Regency O'Hare	March 8-9
Wash., D.C.	Stouffer's National Center Inn	April 6-7

Legal Tools for Computer Contracting and Protection

A 2½-day seminar that shows you how to increase your advantage in dealing with vendors that supply your installation. Includes discussion and review of your own contracts. Led by Roy N. Freed, the nationally known lawyer, author and educator in the field of computer law. Fees: \$325, including continental breakfasts, luncheons and all course materials. \$275 for additional registrants from the same company. Schedule:

Wash., D.C.	Marriot Crystal City	Feb. 4-6
Orlando, Fla.	Sheraton Towers	Feb. 18-20
Seattle	Airport Hilton	May 19-21

Performance Evaluation and Improvement

A 2-day seminar on measurement techniques that are designed to save your installation money. Led by Saul Stimler, author of *Data*

Processing Systems: Their performance, evaluation, measurement and improvement. Fees: \$250 per registrant, including continental breakfasts, luncheons, and all course materials. Schedule:

San Francisco	Dunfey's Royal Coach	Jan. 19-20
New York	Summit Hotel	Feb. 9-10

Data Communications Course #1010 -

Practical Data Communications Systems & Concepts

A 2-day seminar on the newest advances in data communications, including SDLC, DDS, new tariffs, equipment characteristics, and the impact of satellite carriers. Led by Dr. Dixon Doll, Teleprocessing consultant. Fees: \$350, including continental breakfasts, luncheons, and workbook and reference materials. \$300 for additional registrants from the same company. Schedule:

New York	Essex House	Jan. 26-27
Chicago	Hyatt Regency O'Hare	Mar. 15-16

Data Communications Course #1020 -

Advanced Teleprocessing Systems & Concepts

A follow-up to course #1010, this 3-day seminar emphasizes techniques that minimize operating costs in commercial data communications networks. Also led by Dr. Dixon Doll. Fees: \$450, including continental breakfasts, luncheons, and an extensive set of customized course materials. \$400 for additional registrants from the same company. Schedule:

New York	Essex House	Feb. 23-25
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☐ Please reserve space for me at the following seminar(s): _____ City _____ and send details.

☐ Please send me more information on the _____ seminar.

To: **Ed Bride**
Vice President, Editorial Services
The Conference Company
797 Washington Street
Newton, Mass. 02160

Name _____ Title _____
Company _____
Address _____ City _____
State _____ Zip _____ Phone (____) _____

NOTE: If time is short, you may reserve space at any seminar by calling collect. Call Miriam Ober at (617) 965-5800.

Progress Report

370/STOR 145: ONE OUT OF EVERY 12 370/145 PROCESSORS NOW USE IT.

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370/STOR 145 is by far the best-selling add-on memory for IBM System/370 Model 145 processors. More than 60 million bytes are installed and operating today.

What makes it so popular? It's the differences.

☐ 370/STOR 145 is the *only* add-on memory that can be installed, expanded and modified with no alteration of your IBM floppy disc file. That means easier operations with a resultant savings on time and money.

☐ 370/STOR is the *only* add-on memory that can attach to any amount of host 145 memory on any 370/145 processor. Our unique "third port" makes it possible.

☐ 370/STOR is the *only* add-on memory that

offers three unique uptime enhancements. A reconfiguration switch that lets you dial out failed sectors and keep running. An off-line switch that lets you run on either host IBM or Cambridge memory. And comprehensive memory protection features that automatically detect and correct all single-bit errors.

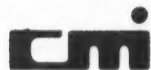
☐ 370/STOR 145 is the *only* add-on memory that can be installed initially, and upgraded later, in as little as a shift-and-a-half. A no-hassle memory that goes in easy.

If that isn't enough, consider this: you can save more than \$120,000 per half megabyte when you buy 370/STOR 145!

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Contact our sales offices for further information: Boston (617) 271-6400 • Westport, Conn. (203) 227-7027 • Philadelphia (215) 295-1186 • Cleveland, Ohio (216) 842-2808 • Columbus, Ohio (614) 459-0154 • Atlanta, Ga. (404) 252-1382 • Hollywood, Fla. (305) 925-3348 • San Francisco (415) 692-4806 • New York City (201) 871-0110 • Briarwood, N.Y. (212) 846-3841 • Chicago (312) 449-5260 • Detroit (313) 557-4080 • Washington, D.C. (703) 683-5323 • Dallas (214) 231-4804 • Houston (713) 661-0381 • Los Angeles (213) 595-1845 • Charlotte, No. Carolina (704) 568-1787 • St. Louis, Missouri (314) 822-2212 • Toronto (416) 677-5667 • Montreal (514) 861-6779 • Subsidiaries: Cambridge Memories GmbH, 6078 Neu Isenburg, West Germany 06102-36092 • Cambridge Memories AG, CH 8002 Zurich, Switzerland 00411-253824.



LEGEND

1. All computer figures are taken from projections of International Data Corporation, the world's largest EDP market research firm.
2. State-by-state numbers are number of computer systems in state.
3. Percentage figures represent percent of total U.S. computer systems installed in state, measured by value.
4. States in lighter shading are ten largest measured by value of computer systems installed. States in darker shading and Washington, D.C. are next biggest.
5. Cities shown are 1976 Computer Caravan sites. Inner circles are 100-mile radius from city. Outer circles (where shown) are 200-mile radius from city.

Going your way is our way.

Computer Caravan/76 brings a national computer conference to key computer-using states across the country.

Measured by value of computer systems installed, the ten largest states in the U.S. (lighter shading on map) account for more than 60% of all computer systems in the United States. Adding the next biggest areas - 7 states and the District of Columbia (darker shading on map) - we get almost 80% of all the U.S. Computer Installations, measured by value. And it's these key states in the computer world which will be host to - or nearby - one or more of the nine cities in the Computer Caravan/76 - the travelling computer users' forum and exhibition sponsored by *Computerworld*.

To general and data processing management, this means a unique opportunity to see a national computer show without leaving the office for a week and travelling across the country. It's a chance to keep up on the latest information in our user-to-user forums and on the latest products and services in our complete exhibition.

And thousands of key business executives will take advantage of this opportunity as the Caravan moves across the country. The '76 Caravan can expect attendance of over 30,000, and unlike any other computer show, they will represent the majority of the computer installations in the 17 states and the District of Columbia - that account for 80% of all U.S. computer systems installed. That's true national coverage.

As a marketer of data processing products and services, the Computer Caravan offers you a unique opportunity to meet the professionals who run our country's computer installations in a one-to-one, business ori-

ented atmosphere. Because there are 27 different show days, no one Caravan day is too crowded to give you the opportunity to present your products or services in detail - either on our exhibit floor, or in your own product seminar. And the 1976 Caravan offers several innovations which can make it more suitable to your individual marketing problems:

1. For companies with limited marketing areas, there are 3 regional tours (East, Midwest or West) to choose from - or our new "Major City Tour" (New York, Chicago and Los Angeles). You'll be covering only part of the total market, but that may be all you want - and costs are much less.

2. For companies specializing in the OEM market, there is our new companion show, COMPDESIGN 76. Sponsored by *Computer Design* magazine, this show will appear in the same halls with the Computer Caravan in five key OEM markets: Boston, New York, Chicago, San Francisco, and Los Angeles. It will attract thousands of key computer designers, and will also be open to Caravan attendees in those cities.

3. Data communications marketers can take advantage of our DATA-COMM 76 add-on, which gives you a spot in the national data communications show sponsored by *The Data Communications User* magazine.

There's a lot more we'd like to tell you about Computer Caravan/76, but if you're interested in exhibiting, time is short. So send in the coupon right away.

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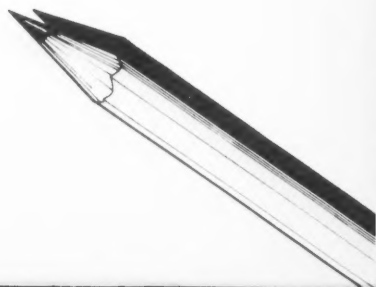
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CIRCULATION DEPARTMENT



On a Saturday, fire destroyed the roof structure over the furnace area at Ramtek Corp. and rendered 10,000 sq ft of space unusable.



On Monday there was production as usual at Ramtek in an adjacent building, thanks to volunteer action of employees over the weekend.

After Fire Destroys Plant

Employees Help Keep Lost Time Low

SUNNYVALE, Calif. — Quick action over a weekend by Ramtek Corp. employees enabled the maker of multicolor graphics displays to be back in production Monday morning, after a fire on Saturday morning had rendered about 10,000 sq ft of manufacturing space unusable.

The fire, which appears to have started in a bank of burn-in fur-

naces, was spotted at 3 a.m. Saturday.

By 5 a.m., the blaze had been extinguished, and concerned employees and their families were already gathering at the scene.

Within a few hours, floor space had been cleared in an adjacent building, and salvagable tools, instruments, supplies and work benches were being moved out

of the fire area, cleaned up and moved in.

"To say that we had come out of this unscathed would be ridiculous," said President Charles McEwan, "but, because of these truly fantastic people here, our losses in time will now be counted in weeks instead of months."

"For example, we had a system in here that was to have been shipped to the Jet Propulsion Laboratory in Pasadena, Calif. on that Wednesday. It was totally destroyed in the fire."

Ramtek managed to meet the original shipping date of Wednesday, he said.

"For our current orders, we expect delays of no more than three to six weeks, McEwan said. For new orders, we are quoting 90 days. We are also confident that a new, full-scale manufacturing facility will be completed and in full production in about three months."

Remex Floppy Disk Drive Accepts Hard-, Soft-Sector Diskettes

SANTA ANA, Calif. — Remex has introduced the RFD 7400E flexible disk drive, which accepts IBM-formatted soft-sectored diskettes as well as 32-hole hard-sectored diskettes.

The 7400E, which Remex calls a "universal" drive, includes its own unit select decoding circuitry allowing four drives to be attached to a single interface cable and permitting four drives to be controlled by one set of drivers and receivers in the host system. Any of the drives can be addressed by a two-digit binary number.

The unit, which sells for \$650 in single quantities with OEM discounts available, is said to increase the total capability of flexible disk technology in OEM

systems while reducing the logic requirement in the host system.

The 7400E includes a multi-drive seek capability, which allows up to four units to seek new tracks simultaneously while the CPU is free to perform other tasks, Remex said.

Remex is at 1733 Alton St., 92705.

Orders & Installations

Wentworth Institute has ordered a PDP-11/70 from Digital Equipment Corp. to support both instructional and administrative functions at the school.

The city of Chattanooga's DP department has ordered Control Data Corp. peripherals to replace IBM equipment. The units include a 33145 memory, a 38031 tape controller, five 34201 tape drives, two 38301 disk controllers, eight 33301 disk units and a 28211 printer with integrated controller and a 14161 printer train.

The Naval Electronics Systems Command has ordered Data-products Corp.'s Model 2910 militarized teleprinters for use in shipboard communications systems.

The Energy Planning Division of Montana's Department of Natural Resources has installed Broomall Industries' GP-100 graphics processing system for use in Montana's utility facility siting study.

Applied Business Services has installed Diva, Inc.'s DD-50 series mass storage system.

POSITION ANNOUNCEMENTS

MINICOMPUTER PROGRAMMER

Kitt Peak National Observatory
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position announcements	position announcements	position announcements	position announcements	position announcements	
<p>DATA PROCESSING SR. PROGRAMMER ANALYST We are seeking a programmer analyst who has 3 years COBOL experience with manufacturing applications in a machinery manufacturing environment. The position will require assisting in the implementing of a full scale manufacturing system utilizing Bill of Material, MRP, and Machine Loading. This system will involve multi plant communication through remote terminals and cathode ray tubes. The successful candidate should have a degree, or equivalent experience in the above areas, ready now to assume a senior slot, and with management potential.</p> <p>The candidate will be working with fourth generation concepts and equipment with a dynamic company. The initial assignment will be in Worcester, Mass. with relocation to Charlotte, N.C. within a year; relocation expense paid.</p> <p>Please send resumes and salary requirements to Richard Stahle, Industrial Relations Manager, Crompton & Knowles Corp., 93 Grand St., Worcester, Mass. 01613, Tel. (617) 753-5431 ext. 245.</p>	<p>DIRECTOR - MANAGEMENT INFORMATION SYSTEMS Salary \$24,618 - \$29,904 annually County of Ventura is seeking individual with substantial high level managerial and technical experience in the field of data processing to be responsible for the overall operation of their data processing department, which uses an IBM 370-145 computer system.</p> <p>Submit resume no later than 12/31/75 to: Beverly Langstaff, Personnel Analyst VENTURA COUNTY PERSONNEL DEPT. 290 Maple Court, Suite 220 Ventura, Calif. 93003 An affirmative Action/Equal opportunity employer</p>	<p>Ph.D.'s in Computer Science are invited to apply for a faculty position which may be available beginning in Sept., 1976. Applicants for the position should submit, in addition to a current resume and list of five professional references, evidence of successful teaching experience and evidence of the ability to provide positive professional impetus to the Computer Science program of the department. Applications are particularly encouraged from individuals with considerable experience in the areas of data structures, file management, and computer graphics. This University is subject to the requirements of Executive Order 11246 and is an affirmative action employer. All interested persons are encouraged to apply to Daniel F. Stubbs, Chairman, Computer Science & Statistics Dept., California Polytechnic State University, San Luis Obispo, California 93407. Applications must be received by March 15, 1976.</p>	<p>SOFTWARE-TECH SUPPORT Buffalo based data center of national firm seeks indiv. with min 3 yrs. in tech support area. Take resp. for operating syst maintenance & reliability; dev of system data base; design of network wide standards for software modification, testing & implementation. Perform benchmark testing to optimize user appl. IBM OS/VS2 shop. Degree. \$17K (fee paid). Contact P. Siegal</p>	<p>SYSTEMS PROGRAMMING POSITION Large midwestern university has immediate opening for a system programmer with at least two years experience working with MVT and HASP. Responsibilities include regular and emergency maintenance on a 360/67, also design, development and installation of enhancements to the above system.</p> <p>Minimum qualifications for position are bachelor's degree (or equivalent) in Computer Science, Mathematics, Physics or related discipline with at least three years university or industrial experience as a systems programmer working with assembler level coding.</p> <p>Please send complete resume to CW Box 4543, 797 Washington St., Newton, Mass. 02160. Excellent benefits and working conditions. Salary commensurate with education and experience. An Equal Opportunity Employer</p>	
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	<p>SENIOR PROGRAMMER Dyanmic Co. needs Sr. Programmer. 2 to 4 yrs. experience. Minimum 18 mo. Applications Programming using ALC. Supervisory experience desirable. Salary based on qualifications and experience. Friendly, small town living in beautiful Virginia countryside.</p> <p>Resumes to: Wiland Associates P.O. Box 899 Culpeper, VA 22701</p>	<p>SYSTEMS PROGRAMMER SALARY TO 19K FLA. LOCATION Expanding IBM-370 Installation, 3 years experience in Assembler & COBOL Programming, CICS experience required. Located 40 miles NE of Tampa. Salary history and requirement. Send resume to Pasco County Data Processing, 410 E. Meridian Avenue, Dade City, FL 33525, Phone (904) 583-3625</p>	<p>BUY SELL SWAP</p>		
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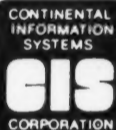
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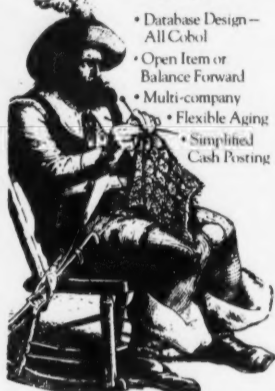
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Microdata Gains 71% in Year

IRVINE, Calif. — Microdata Corp.'s earnings rose 71% for the year ended Aug. 31 following a record quarter for the firm during the last period.

During the fourth quarter the firm earned \$753,647 or 48 cents a share, including a \$367,000 tax credit, compared with a loss of \$99,610 or 6 cents a share in the same period last year.

Revenues during the three months rose to \$5.3 million from \$4.3 million in the same period last year.

For the year, Microdata revenues totaled \$15.9 million compared with \$13.8 million during 1974, while earnings soared to \$1.1 million or 71 cents a share compared with \$641,466 or 41 cents a share last year.

There was a tax credit of \$501,000 compared with \$265,000 for 1974.

Triple in Nine Months

Inforex Earnings Climb 31% in Quarter

BURLINGTON, Mass. — Inforex, Inc.'s earnings for the third quarter rose 31% and more than tripled in the nine months over figures for the comparable year-ago periods.

Earnings for the quarter rose to \$297,000 or 10 cents a share compared with \$226,000 or 8 cents a share in the same period last year.

Orders for systems during the quarter exceeded the depressed levels experienced during the second quarter, the firm said.

Quarterly revenues rose 5% to \$13.7 million compared with \$13.1 million in the year-ago period. There was \$1.1 million in sales to Inforex's Leasing II in the recent period.

Although leases recorded as sales and other sales declined by about \$1 million each, rental

and service revenues grew 27% in the quarter to \$7.2 million compared with \$5.7 million in the same period last year.

During the quarter, Inforex purchased several hundred data entry systems it had sold to Leasing II under a third-party purchase agreement.

The repurchase is expected to add significantly to profits in the current and future quarters, the firm said.

Nine-month revenues grew 16% to \$41.5 million, including \$2.6 million in sales to Leasing II, compared with \$35.6 million in the same period last year.

Rental and service income rose to \$20.3 million from \$15.8 million in the year-ago nine months.

Earnings for the nine months soared to \$602,000 or 21 cents a share compared with \$164,000

or 6 cents a share in the same period last year.

President Timothy C. Cronin cited continuing margin improvement.

"Gross profits as a percent of revenues edged up by a point and a half, while expenses for engineering, selling and administration as a percent of revenues dropped by over four points," he said.

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Reliance Posts Third-Quarter Loss

NEW YORK — Reliance Group, Inc. posted a third-quarter loss of \$17.5 million, reflecting losses from its decision to sell off its time-sharing operations, Leasco Response, Inc. and Leasco Response Ltd.

The loss included a \$2.9 million operating loss, \$2.2 million on the sale of securities, \$7.2 million on the discontinued domestic and foreign time-sharing operations and an extraordinary loss of \$5.3 million.

Revenues rose to \$225.9 million from \$195.3 million in the

year-ago period.

For the nine months, the firm lost \$23.2 million compared with earnings of \$11.3 million in the same period last year.

The loss included an operating loss of \$16.1 million, capital gains of \$3.8 million, an \$8.1 million loss on discontinued time-sharing operations and an extraordinary loss of \$2.7 million, the firm said.

Nine-month revenues totaled \$648.7 million compared with \$573.1 million during the same period last year.

AUSTRALIA

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Teletype Corporation's exhibit features its new, 300 lpm, tractor feed impact printers — offering exceptional flexibility and reliability at an impressively low price. The highly successful (600,000 plus sold) very economical model 33 ASR will also be shown.

Earnings Reports

STORAGE TECHNOLOGY			
Three Months Ended Sept. 26			
	1975	a1974	
Shr Ernd	\$.40	\$.34	
Revenue	27,344,000	20,626,000	
Earnings	1,703,000	1,383,000	
9 Mo Shr	1.06	.95	
Revenue	69,455,000	56,313,000	
Earnings	4,464,000	3,806,000	

a-Restated.

UNITED COMPUTING			
Year Ended June 30			
	1975	1974	
Revenue	\$3,662,326	\$2,280,362	
Loss	180,140	49,384	

MSI DATA			
Three Months Ended Sept. 27			
	1975	a1974	
Shr Ernd	\$.22	
Revenue	\$7,175,220	8,366,488	
Disc Op	(1,421,598)	(198,752)	
Earnings	(1,341,316)	423,564	
6 Mo Shr38	
Revenue	15,427,694	15,833,937	
Disc Op	(1,564,354)	(429,013)	
Spec Cred	b99,985	
Earnings	(1,122,072)	742,250	

a-Restated for discontinued operations. b-Cumulative effect of accounting changes from prior periods.

VANIER GRAPHICS			
Three Months Ended Sept. 30			
	1975	1974	
Shr Ernd	\$.24	a\$.24	
Revenue	6,435,996	5,035,859	
Earnings	245,032	254,022	
6 Mo Shr	.47	a.44	
Revenue	12,419,363	9,510,458	
Earnings	484,384	462,241	

a-Reflects 8% stock dividend in August 1974 and three-for-two stock split in July 1975.

GREYHOUND COMPUTER			
Three Months Ended Sept. 30			
	a1975	1974	
Shr Ernd	\$.04	\$.08	
Revenue	15,242,000	13,236,000	
Earnings	161,000	b334,000	
9 Mo Shr	.07	.25	
Revenue	46,412,000	39,705,000	
Earnings	301,000	b1,080,000	

a-Includes results of Computer Leasing Co., purchased in December 1974. b-Includes \$118,000 gain on sale of investment.

MARTIN MARIETTA			
Three Months Ended Sept. 30			
	1975	a1974	
Shr Ernd	\$.86	\$1.11	
Revenue	290,113,000	323,021,000	
Earnings	21,416,000	27,237,000	
9 Mo Shr	1.68	2.68	
Revenue	782,333,000	918,686,000	
Earnings	b41,429,000	63,875,000	

a-Restated for LIFO accounting. b-Includes \$5.3 million net gain from sale of real estate.

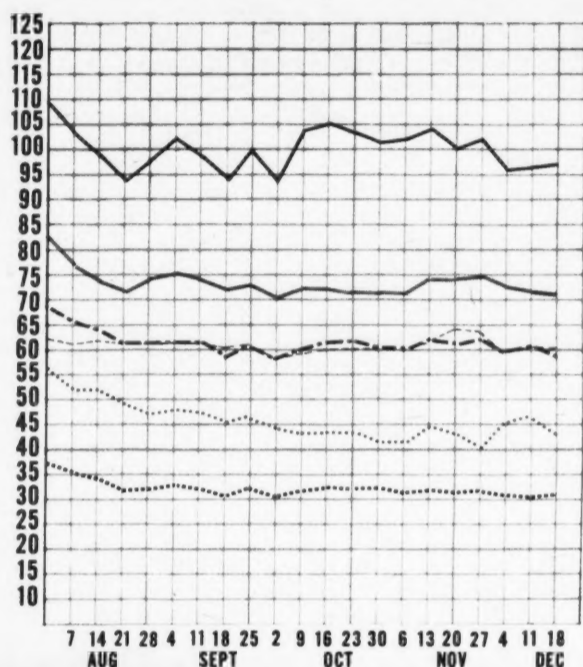
PRIME COMPUTER			
Three Months Ended Sept. 28			
	1975	1974	
Shr Ernd	\$.10	
Revenue	2,994,387	\$1,760,709	
Tax Cred	111,700	7,479	
Earnings	202,101	(139,295)	
9 Mo Shr	.20	
Revenue	7,910,491	4,452,815	
Tax Cred	211,700	42,539	
Earnings	410,817	(546,375)	

T-BAR			
Three Months Ended Sept. 30			
	1975	a1974	
Shr Ernd	\$.18	b\$.13	
Revenue	1,135,332	1,094,386	
Earnings	75,358	54,615	
9 Mo Shr	.53	b.34	
Revenue	3,443,242	2,841,832	
Earnings	223,305	142,183	

a-Restated. b-Adjusted for a 5% stock dividend paid in April 1975.

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Computerworld Stock Trading Summary

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All statistics compiled,
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 TRADE*QUOTES, INC.
 Cambridge, Mass. 02139

COMPUTER SYSTEMS					
	1975	CLOSE	WEEK	WEEK	
	RANGE	DEC 17	NET	PCT	
	(1)	1975	CHNGE	CHNGE	
N BURRUCHS CORP	62-109	85 1/4	+ 3/4	+0.8	
C COMPUTER AUTOMATION	2- 11	9 1/4	- 3/8	-3.8	
A CONTROL DATA CORP	11- 23	17 5/8	+ 3/8	+2.1	
N DATA GENERAL CORP	10- 39	36 3/8	+2 3/8	+6.9	
O DATAPOINT CORP	6- 26	21 1/4	0	0.0	
C DIGITAL COMP CONTROL	1- 4	1 1/2	0	0.0	
N DIGITAL EQUIPMENT	46-140	130 5/8	+4	+3.1	
N ELECTRONIC ASSOC.	2- 3	2	+ 1/8	+6.6	
A ELECTRONIC ENGINEER.	5- 10	7 3/8	- 1/8	-1.6	
N FOXBORO	23- 42	27 3/4	+ 3/8	+1.3	
O GENERAL AUTOMATION	4- 14	5 1/8	- 7/8	-14.5	
C GRI COMPUTER CORP	1- 1	1 1/2	0	0.0	
N HEWLETT-PACKARD CO	58-120	94 3/4	+ 1/4	+0.2	
A HONEYWELL INC	22- 40	32 1/8	- 1/4	-0.7	
N IBM	158-226	219 3/4	+2 1/4	+1.0	
C MICROMEX	1- 10	7	- 1/2	-6.6	
O MICRODATA CORP	2- 10	9 1/2	+ 1/4	+11.7	
O MODULAR COMPUTER SYS	5- 19	10 1/4	+ 1/4	+2.5	
A NCR	15- 39	22 3/4	+1 1/4	+5.8	
C PRIME COMPUTER INC	2- 6	4	+ 1/4	+6.6	
A PERKIN-ELMER	16- 30	22 5/8	+ 5/8	+2.8	
N RAYTHEON CO	26- 59	44 3/4	+1 3/4	+4.0	
N SINGER COMPANY	9- 17	9 5/8	- 1/8	-1.2	
N SPERRY RAND	26- 49	37 3/4	- 1/4	-0.6	
A SYSTEMS ENG. LABS	1- 5	4 1/4	+ 1/4	+6.2	
A VARIAN ASSOCIATES	7- 18	11 7/8	- 7/8	-6.8	
N WANG LABS.	7- 17	9 3/4	- 1/4	-2.5	
N XEROX CORP	47- 86	48 1/8	- 1/8	-2.2	
SOFTWARE & EDP SERVICES					
	1975	CLOSE	WEEK	WEEK	
	RANGE	DEC 17	NET	PCT	
	(1)	1975	CHNGE	CHNGE	
O ADVANCED COMP TECH	1- 1	1	0	0.0	
A APPLIED DATA RES.	1- 10	1 5/8	+ 3/8	+30.0	
N AUTOMATIC DATA PROC	29- 65	54 1/4	+ 5/8	+1.1	
C BRANCO APPLIED SYST	1- 1	1/8	0	0.0	
C COMPUTER DIMENSIONS	2- 6	3	0	0.0	
C COMP ELECTION SYSTEMS	3- 7	4 3/4	- 1/4	-5.0	
O COMPUTER HORIZONS	1- 1	1/2	- 1/8	-20.0	
C COMPUTER NETWORK	1- 3	1 5/8	- 1/4	-13.3	
N COMPUTER SCIENCES	2- 6	3 3/4	+ 1/8	+3.4	
O COMPUTER TASK GROUP	1- 1	5/8	0	0.0	
C COMPUTER USAGE	2- 4	2 7/8	+ 3/8	+15.0	
C COMSHARE	2- 4	2 1/8	- 3/8	-15.0	
O DATAR	1- 2	1	0	0.0	
A ELECT COMP PRG	1- 1	1/8	0	0.0	
O ELECTRONIC DATA SYS.	11- 28	11	- 3/8	-3.2	
O INFORMATIONAL INC	1- 1	1/8	- 1/8	-50.0	
C IPS COMPUTER MARKET.	1- 1	5/8	0	0.0	
O KEANE ASSOCIATES	2- 3	2 5/8	- 1/4	-8.6	
C KEYDATA CORP	2- 4	3	- 1/2	-14.2	
C LOGICON	3- 5	3 3/8	0	0.0	
A MANAGEMENT DATA	1- 3	1 5/8	+ 1/4	+18.1	
A NATIONAL CSS INC	6- 14	9 3/8	+ 1/8	+1.3	
O NATIONAL COMPUTER CO	1- 1	1/8	0	0.0	
A CN LINE SYSTEMS INC	8- 17	12 7/8	+1 3/8	+11.9	
N ONLINE RESEARCH	2- 6	2 7/8	0	0.0	
O PROGRAMMING & SYS	1- 1	1/2	0	0.0	
C RAPIDATA INC	2- 5	4	+ 1/2	+14.2	
O REYNOLDS & REYNOLD	10- 24	13 1/2	- 1/4	-1.8	
C SCIENTIFIC COMPUTERS	1- 1	5/8	- 3/8	-37.5	
O SIMPLICITY COMPUTER	1- 1	1/4	0	0.0	
O TMSHARE INC	7- 21	19 1/4	+1 3/4	+10.0	
A URS SYSTEMS	2- 4	3 3/8	+ 5/8	+22.7	
N WYLY CORP	2- 4	2 3/4	- 1/8	-4.3	
PERIPHERALS & SUBSYSTEMS					
	1975	CLOSE	WEEK	WEEK	
	RANGE	DEC 17	NET	PCT	
	(1)	1975	CHNGE	CHNGE	
N ADDRESSOGRAPH-MULT	4- 9	7 1/2	0	0.0	
O ADVANCED MEMORY SYS	1- 7	3 7/8	+ 1/8	+3.3	
N AMPLEX CORP	3- 7	4 1/2	- 1/4	-5.2	
O ANDERSON JACOBSON	1- 3	1 5/8	- 1/8	-7.1	
O BEEHIVE MEDICAL ELEC	1- 5	3 3/8	+ 1/4	+8.0	
A BOLT, BERANEK & NEW	5- 13	6 7/8	- 1/8	-1.7	
A BUNKER-RAND	4- 8	3 5/8	- 1/4	-6.4	
A CALCOMP	3- 7	3 1/4	0	0.0	
O CAMBRIDGE MEMORIES	1- 5	1 7/8	- 1/8	-6.2	
N CENTRONICS DATA COMP	7- 25	18	+ 1/8	+0.6	
O CODEX CORP	15- 38	28	-2	-6.6	
C COGNITRONICS	1- 2	3/4	+ 1/8	+20.0	
C COMPUTER COMMUN.	1- 2	7/8	- 1/8	-12.5	
C COMPUTER CONSOLES	3- 7	4	+ 1/2	+14.2	
A COMPUTER EQUIPMENT	1- 2	1 1/8	- 1/8	-10.0	
C COMPUTER MACHINERY	1- 2	1	+ 3/8	+60.0	
O COMPUTER TRANSCIVER	1- 2	3/4	- 1/8	-14.2	
C CONTEC	2- 5	3 1/8	0	0.0	
N CONRAC CORP	12- 30	26 7/8	+ 7/8	+3.3	
SUPPLIES & ACCESSORIES					
	1975	CLOSE	WEEK	WEEK	
	RANGE	DEC 17	NET	PCT	
	(1)	1975	CHNGE	CHNGE	
O BALTIMORE BUS FORMS	4- 5	4 1/4	0	0.0	
A BARRY WRIGHT	5- 7	5 1/4	- 1/4	-4.5	
O CYBERMATICS INC	0- 1	3/8	0	0.0	
A DATA DOCUMENTS	29- 42	29 1/4	- 3/4	-2.5	
O DUPLIX PRODUCTS INC	12- 25	16 1/2	- 1/2	-2.9	
F ENNIS BUS. FORMS	5- 7	5 3/8	+ 1/8	+2.3	
O GRAHAM MAGNETICS	5- 10	8 1/2	- 1/4	-2.8	
O GRAPHIC CONTROLS	8- 21	11 3/4	- 1/4	-2.0	
N 3M COMPANY	43- 68	58 3/4	+1	+1.7	
C MICRO CORP LTD	39- 51	47 1/2	+1 3/4	+3.8	
N NASHUA CORP	9- 22	9 1/2	0	0.0	
C STANDARD REGISTER	11- 20	16 1/4	0	0.0	
O TAB PRODUCTS CO	4- 8	4 1/2	0	0.0	
N UARCE	17- 24	19 7/8	- 1/8	-0.6	
C VANIER GRAPHICS CORP	4- 7	4 3/4	0	0.0	
A WABASH MAGNETICS	3- 5	3 5/8	0	0.0	
N WALLACE BUS FORMS	15- 25	18 1/2	0	0.0	

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
 L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
 O-T-C PRICES ARE BID PRICES AS OF 3 P.M. OR LAST BID
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